PHOTOFACT* FOLDER SET

*TRADE MARK

NO. 136

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The PHOTOFACT Servicer

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"Hearken to your competitors, for they first find out your faults." - Anon.

SOURCE AND DATE CODES

—o—

1. What is the RTMA Production Source Code?

It is a standard numeric symbol of three digits, assigned and registered by RTMA headquarters, which manufacturers may stamp or mark on any or all of their products to identify the production source.

The RTMA standard code, in addition, provides for adding of numerals to the production source symbol to identify the year and week of production.

2. How does the date code work?

In addition to marking the production source of his company's products, a manufacturer may wish to identify the date. He can do this by adding the last digit of the production year plus the number of the week of that year to his production source code.

A hypothetical example of the application of date code to the source code follows: Say a company is assigned the production source symbol 112. To add the date code the manufacturer would add a numeral for the year—such as "1" for the current year or "2" for 1952—and another number for the week of the year. Thus the combined source and date codes might be, in this case,

112112

which would represent the company's production code number "112", plus "1" for 1951, the production year, and "12" for the week of March 18-24, the production week. For convenience in identifying the week, tables on pages 17 and 18 give the numbers of each week in both 1951 and 1952.

ALPHABETICAL LIST

RTMA Production Source Code Symbols

January 1, 1951

(* Indicates non-members)

Company	Code No.
*Acme Electric Corporation, Cuba, N. Y.	413
*Admiral Corporation, Chicago 47, Ill.	101
Advance Transformer Company, Chicago 40, Ill.	669
Aerovox Corporation, New Bedford, Mass.	102
Aircraft-Marine Products, Inc., Harrisburg, Pa.	581
Air King Products Company, Inc., Div. of Hytron Radio & Electronic Corp., Brooklyn 32, N. Y.	105
*Ajax Condenser Co., Inc., Chicago 14, Ill.	705
*Aladdin Radio Industries, Chicago, Ill.	689
*Alamo Television & Radio Company, San Antonio, Texas	645
Alcon Metal Products, Inc., Chicago 47, Ill.	573
Allen-Bradley Company, Milwaukee 4, Wis.	106
The Alliance Manufacturing Co., Alliance, Ohio	107
All Star Products, Inc., Defiance, Ohio	110
Altec Lansing Corporation, Beverly Hills, Calif.	391
American Condenser Company, Chicago 40, Ill.	109
*American Insulator Corporation, New Freedom, Pa.	585
American Lava Corporation, Chattanooga 5, Tenn.	681
American Phenolic Corporation, Chicago 50, Ill.	554
*American Radionic Co., Inc., Brooklyn 17, N. Y.	648
American Structural Products Co., Sub. of Owens-Illinois Glass Co., Toledo 1, Ohio	647
American Television, Inc., Chicago 5, Ill.	633
American Television & Radio Co., St. Paul 1, Minn.	551
American Volume Control Corp., New York 6, N. Y.	519
Amperex Electronic Corporation, Brooklyn 1, N. Y.	111
Ampro Corporation, Chicago 18, Ill.	673
Amy, Aceves & King, Inc., New York 18, N. Y.	112
*Anaconda Wire & Cable Company, Hastings-On-Hudson 6, N. Y.	547
*Anchor Electronics Inc., Union City, N. J.	707
*Anchor Plastics Company, New York 13, N. Y.	629
Anchor Radio Corporation, Chicago 23, Ill.	623
Andrea Radio Corporation, Long Island City 1, N. Y.	113
Andrew Corporation, Chicago 19, Ill.	402
Arthur C. Ansley Mfg. Co., Doylestown, Pa.	717
Arcturus Elecronics Inc., Newark 4. N. J.	667
A. R. F. Products, Inc., River Forest, Ill.	115
*Argus, Incorporated, Ann Arbor, Michigan	344
The Arnold Engineering Company, Sub. of Allegheny Ludlum Steel Corp., Marengo, Ill.	116
Arvin Industries, Inc., Columbus, Ind.	248
The Astatic Corporation, Conneaut, Ohio	345
Audak Company, Inc., New York 18, N. Y.	517
*Audio Electric Company, Chicago 26, Ill.	514
Audio-Tone Oscillator Company, Bridgeport 3, Conn.	118
Automatic Manufacturing Corp., Newark 4, N. J.	119
Automatic Radio Mfg. Co., Inc., Boston 15, Mass.	120
Barker & Williamson, Upper Darby, Pa.	461
Barnes Metal Products Company, Chicago 23, Ill.	588
Basler Electric Company, Highland, Ill.	695
The Bead Chain Manufacturing Co., Bridgeport 5, Conn.	122
Belden Manufacturing Company, Chicago 44, Ill.	579
Bell Sound Systems, Inc., Columbus 7, Ohio	708
Belmont Radio Corporation (Raytheon Manufacturing Co.) Chicago 39, Ill.	124
Bendix Radio, Division of Bendix Aviation Corp., Baltimore 4, Md.	125
Bentley, Harris Mfg. Company, Conshohocken, Pa.	126
*Best Manufacturing Co., Inc., Irvington 11, N. J.	371
Bliley Electric Company, Erie, Pa.	128
David Bogen Co., Inc., New York 12, N. Y.	589
*Bowers Battery and Spark Plug Co., Reading, Pa.	619
The William Brand and Co., Inc., Willimantic, Conn.	130
British Industries Corporation, New York 13, N. Y.	409
Brunswick Radio, Division of Radio & Television, Inc., New York 16, N. Y.	278

Company	Code No.
Caledonia Electronics & Transformer Corp., Caledonia, N. Y.	503
Camburn, Inc., Woodside, Long Island, N. Y.	430
C. F. Cannon Co., Springwater, N. Y.	133
Cannon Electric Development Company, Division of Cannon Manufacturing Corp., Los Angeles 31, Calif.	440
Capehart-Farnsworth Corporation, Fort Wayne 1, Ind.	177
Carter Parts Company, Chicago 10, Ill.	610
Celco (Constantine Engineering Laboratories Co.), Mahwah, N. J.	692
Central Coil Company, Inc., Indianapolis 22, Ind.	637
Chicago Condenser Corporation, Chicago 47, Ill.	135
*Chicago Electronic Engineering Company, Inc., Chicago 47, Ill.	166
Chicago Molded Products Corp., Chicago 51, Ill.	136
Chicago Telephone Supply Corp., Elkhart, Ind.	137
Chicago Transformer Division, Essex Wire Corporation, Chicago 18, Ill.	138
Cinch Manufacturing Corporation, Chicago 24, Ill.	139
Clarostat Mfg. Co., Inc., Dover, N. H.	140
Cleveland Electronics, Inc., Cleveland 3, Ohio	433
Clippard Instrument Laboratory, Inc., Cincinnati 14, Ohio	530
*Coil Engineering & Mfg. Co., Inc., Roanoke, Ind.	141
Collins Radio Company, Cedar Rapids, Iowa	439
Colonial Radio Corporation (Sylvania Electric Products, Inc.), Buffalo 7, N. Y.	142
Columbus Electronics Corporation, Yonkers, N. Y.	528
Columbus Process Co., Inc., Columbus, Ind.	450
Communication Measurements Laboratory, Inc., New York 6, N. Y.	427
Conrac Incorporated, Glendora, Calif.	680
*Consolidated Radio Products Co., Chicago 10, Ill.	145
Consolidated Wire & Associated Companies, Chicago 16, Ill.	607
Continental Carbon Inc., Cleveland 11, Ohio	146
Continental Electric Company, Geneva, Ill.	147
*Control Corporation, Minneapolis 14, Minn.	712
Corning Glass Works, Corning, N. Y.	148
Cornish Wire Company, Inc., New York 7, N. Y.	149
Cosmic Radio Corporation, New York 59, N. Y.	704
Crescent Industries, Inc., Chicago 41, Ill.	150
Croname, Incorporated, Chicago 13, Ill.	151
Crosley Division, Avco Manufacturing Corp., Cincinnati 25, Ohio	152
Crucible Steel Company of America, New York 17, N. Y.	525
J. W. Davis & Company, Dallas 9, Texas	563
Davis Electric Company, Cape Girardeau, Mo.	628
*Dearborn Glass Company, Chicago 8, Ill.	385
Delco Radio Division, General Motors Corporation, Kokomo, Ind.	466
*DeLuxe Coils, Inc., Wabash, Ind.	598
DeWald Radio Mfg. Corp., Long Island City 1, N. Y.	155
Drake Manufacturing Company, Chicago 22, Ill.	586
Wilbur B. Driver Company, Newark 4, N. J.	156
*Dumont Electric Corporation, New York 34, N. Y.	157
Allen B. DuMont Laboratories, Inc., Clifton, N. J.	158
*DX Radio Products Company, Inc.. Chicago 47, Ill.	159
Dynavox Corporation, Long Island City 1, N. Y.	455
Hugh H. Eby, Inc., Philadelphia 44, Pa.	160
Eckstein Radio & Television Co., Minneapolis 6, Minn.	161
Eitel-McCullough, Inc., San Bruno, Calif.	162
*Electrical Assemblies, Inc., Grand Haven, Mich.	660
Electrical Reactance Corporation, Franklinville, N. Y.	163
*Electrical Utilities Company, La Salle, Ill.	569
*Electrical Windings, Inc., Chicago 39, Ill.	682
*Electro-Connector Corporation, Philadelphia 22, Pa.	599
The Electro Motive Mfg. Co., Inc., Willimantic, Conn.	164
Electronic Components Corporation, Chicago 10, Ill.	515
Electronic Enterprises, Inc., Newark 4, N. J.	545
Electronic Industries Inc., Springfield, Ohio	675
Electronic Products Company, Mount Vernon, N. Y.	557
Electronic Tube Corporation, Philadelphia 18, Pa.	170
Electro-Voice, Inc., Buchanan, Mich.	649
*Ellar Woodcraft Corp., New York 1, N. Y.	576
*El-Rad Manufacturing Co., Chicago 13, Ill.	632
*Eltran Corporation, St. Anne, Ill.	603
Emerson Radio & Phonograph Corp., New York 11, N. Y.	171
Empire Coil Company, Inc., New Rochelle, N. Y.	452
Ensign Coil Company, Chicago 23, Ill.	172
Erie Resistor Corporation, Erie, Pa.	173
Espey Manufacturing Co., Inc., New York 21, N. Y.	174
*Essex Electronics, Berkeley Heights, N. J.	425
*Essex Wire Corporation, Fort Wayne 6, Ind.	175
Fada Radio and Electric Co., Inc., Belleville, N. J.	176
*Farmers Engineering & Mfg. Co., Pittsburgh 21, Pa.	561
John E. Fast & Company, Chicago 41, Ill.	178
Federal Telephone & Radio Corp., Clifton, N. J.	179
*Felt Products Manufacturing Co., Chicago 7, Ill.	180
Fidelity Products Co., Inc., So. Orange, N. J.	494
Forbes & Wagner, Inc., Silver Creek, N. Y.	701
*Foster Transformer Company, Cincinnati 23, Ohio	394
A. W. Franklin Mfg. Corp., Long Island City 1, N. Y.	182
Freed Radio Corporation, New York 13, N. Y.	183
*F. & V. Coil Winding Corporation, Newark 5, N. J.	572
*Gates Radio Company, Quincy, Ill.	187
*Gavitt Mfg. Co., Inc., Brookfield, Mass.	360
*General Cable Corporation, New York 17, N. Y.	571
General Cement Mfg. Co., Rockford, Ill.	396
General Ceramics and Stealite Corp., Keasbey, N. J.	685
*General Communication Company, Boston 15, Mass.	459
General Electric Company, Syracuse 1, N. Y.	188
General Electronics, Inc., Paterson 3, N. J.	189
The General Industries Company, Elyria, Ohio	190
General Instrument Corporation, Elizabeth 3, N. J.	191
General Laminated Products, Inc., Chicago 8. Ill.	192
General Magnetic Corporation, Detroit 34, Mich.	193
General Radio Company, Cambridge 39, Mass.	194
General Railway Signal Company, Rochester 2, N. Y.	644
General Vacuum Tube Corp., Ardsley, N. Y.	714
Gits Molding Corporation, Chicago 44, Ill.	196
Glaser-Steers Corporation, Belleville 9, N. J.	670
*Glass Products Company, Chicago 37, Ill.	475
Globe-Union Inc., Centralab Division, Milwaukee 1, Wis.	134
The Fred Goat Co., Inc., Brooklyn 17, N. Y.	197
Good-All Electric Mfg. Co., Ogalalla, Nebr.	446
*The Gramer Transformer Company, Chicago 39, Ill.	596
Grigsby-Allison Company, Inc., Arlington Heights, Ill.	467
The Gudeman Company, Chicago 10, Ill.	438
Edwin I. Guthman & Co., Inc., Chicago 7, Ill.	198
*The Halldorson Company, Chicago 40, Ill.	556
The Hallicrafters Co., Chicago 24, Ill.	199
Harnett Electric Corporation, Port Washington, N. Y.	481
Hawley Products Company, St. Charles, Ill.	204
Haydu Brothers, Plainfield, N. J.	205
Hazeltine Electronics Corporation, Little Neck, Long Island, N. Y.	376
Hedco Manufacturing Corporation, Mount Vernon, N. Y.	535
*Heppner Manufacturing Company, Round Lake, Ill.	575
Herlec Corporation, Sub. of Sprague Electric Co., Milwaukee 3, Wis.	457
The Hickok Electrical Instrument Co., Cleveland 8, O.	508
*Hillburn Electronic Products Co., Brooklyn 22, N. Y.	687
Hoffman Radio Corporation, Los Angeles 7, Calif.	207
John R. Hollingsworth Corporation, Clifton Heights, Pa.	659
*Holyoke Wire and Cable Corporation, Holyoke, Mass.	372
*Hudson Electronics Corporation, Mount Vernon, N. Y.	487
Hytron Radio & Electronics Corp., Salem, Mass.	210
*Ideal Machine Shop, Bayshore, Long Island, N. Y.	664
Illinois Condenser Co., Chicago 22, Ill.	616
The Indiana Steel Products Company, Chicago 2, Ill.	211
Industrial Development Engineering Associates, Inc., Indianapolis 4, Indiana	638
Industrial Television, Inc., Clifton, N. J.	541
International Resistance Company, Philadelphia 8, Pa.	214
Irvington Varnish & Insulator Co., Irvington 11, N. J.	215
Jackson Electrical Instrument Co., Dayton 1, Ohio	216
Jackson Industries, Inc., Chicago 15, Ill.	217
J-B-T Instruments, Inc., New Haven 8, Conn.	442
Jefferson Electric Company, Bellwood, Ill.	218
*Jefferson-Travis Incorporated (Emerson Radio & Phonograph), New York 11, N. Y.	219
Jensen Manufacturing Company, Div. of The Muter Company, Chicago 38, Ill.	220
*Jewel Radio Corporation, Long Island City 1, N. Y.	651
J. F. D. Manufacturing Co., Inc., Brooklyn 4, N. Y.	221
E. F. Johnson Company, Waseca, Minn.	222
Johnson & Hoffman, Inc., Rockville Centre, N. Y.	639
*The Joyner Corporation, Chicago 44, Ill.	511
Kay Electric Company, Pine Brook, N. J.	620
Kerrigan Lewis Manufacturing Co., Chicago 51, Ill.	223
Kester Solder Company, Chicago 39, Ill.	224
Keystone Electronics Company, Stamford, Conn.	699
King Laboratories, Inc., Syracuse 4, N. Y.	225
Kip Electronics Corporation, New York 14, N. Y.	593
The James Knights Company, Sandwich, Ill.	504
Kobzy Tool Company, Chicago 22, Ill.	594
The La Pointe Plascomold Corp., Unionville, Conn.	577
Lenz Electric Manufacturing Co., Chicago 47, Ill.	228
*Leonard Electric Products Co., Inc., Brooklyn 19, N. Y.	570
Littelfuse, Incorporated, Chicago 40, Ill.	230
Lowell Metal Products Corporation, St. Louis 7, Mo.	657
Machlett Laboratories, Incorporated, Springdale, Conn.	231
The Magnavox Company, Fort Wayne 4, Ind.	232
*Magnetic Windings Company, Easton, Pa.	352
P. R. Mallory & Co., Inc., Indianapolis 6, Ind.	235
Markel Electric Products, Inc., Buffalo 3, N. Y.	609

Company	Code No.
H S. Martin & Company, Evanston, Ill.	686
J. A. Maurer, Inc., Long Island City 1, N. Y.	655
Measurements Corporation, Boonton, N. J.	236
Mercury Radio & Television Corp., Chicago 5, Ill.	663
*Merit Transformer Corporation, Chicago 40, Ill.	239
Micamold Radio Corporation, Brooklyn 6, N. Y.	240
*Micro Switch Division (First Industrial Corporation), Freeport, Ill.	241
*Mid-West Coil & Transformer Co., Chicago 14, Ill.	549
*Mifflinburg Body Works, Inc., Mifflinburg, Penna.	622
James Millen Manufacturing Co., Inc., Malden 48, Mass.	242
*Milwaukee Stamping Company, Milwaukee 14, Wis.	424
*Mississippi Products, Inc., Jackson, Miss.	445
Motorola Inc., Chicago 51, Ill.	185
Multi-Tron Laboratory, Chicago 44, Ill.	693
The Muter Company, Chicago 5, Ill.	244
Mycalex Corporation of America, Clifton, N. J.	642
National Aeronautical Corporation, Ambler, Pa.	643
National Company, Inc., Malden 48, Mass.	245
National Fabricated Products, Inc., Chicago 47, Ill.	246
National Moldite Company, Hillside 5, N. J.	367
National Union Radio Corporation, Orange, N. J.	247
The National Varnished Products Corp., Woodbridge, N. J.	479
New York Transformer Co., Inc., Alpha, N. J.	366
North American Philips Company, Inc., New York 17, N. Y.	423
Northern Metal Products Company, Chicago 24, Ill.	640
Oak Mfg. Co., Chicago 10, Ill.	249
The Ohio Carbon Company, Cleveland 11, Ohio	250
Ohmite Manufacturing Company, Chicago 44, Ill.	251
Operadio Manufacturing Co., St. Charles, Ill.	252
*The Orsenigo Co., Inc., Westerly, Rhode Island	625
Orsyd Company, Detroit 10, Mich.	656
Otis Radio & Electric Corp., Hawarden, Iowa	552
Oxford Electric Corporation, Chicago 15, Ill.	465
Packard-Bell Company, Los Angeles 64, Calif.	254
*Panelyte Division, St. Regis Paper Co., New York 17, N. Y.	256
Parisian Novelty Company, Chicago 9, Ill.	257
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.	676
Penn Transformer Corporation, Bellefonte, Pa.	665
Perfection Electric Company, Chicago 16, Ill.	592
Permoflux Corporation, Chicago 39, Ill.	258
*Permoflux Corporation, Glendale 5, Calif.	395
Permo, Incorporated, Chicago 26, Ill.	259
*Phalo Plastics Corporation, Worcester 8, Mass.	697
Philco Corporation, Philadelphia 34, Pa.	260
Philmore Manufacturing Co., Inc., New York 3, N. Y.	262
Pickering and Company, Inc., Oceanside, N. Y.	631
Pilot Radio Corporation, Long Island City 1, N. Y.	264
Pioneer Electronics Corporation, Santa Monica, Calif.	706
*Pioneer Electronics Corp., Salem, Mass.	691
Plastoid Corporation, Hamburg, N. J.	435
Polorad Electronics Corporation, Brooklyn 11, N. Y.	562
Powdered Metal Products Corporation of America, Franklin Park, Ill.	539
Precision Apparatus Company, Inc., Elmhurst, L. I., N. Y.	505
Premax Products Division, Chisholm-Ryder Co., Inc., Niagara Falls, N. Y.	267
*Harry A. Prock Cabinet Company, Glenside, Pa.	374
Product Development Co., Inc., Arlington, N. J.	703
*Pyramid Electric Company, North Bergen, N. J.	472
*Q. L. C. Corporation, Summit, N. J.	464
Quality Hardware and Machine Division, Continental Copper & Steel Industries, Inc., Chicago 26, Ill.	269
Quam-Nichols Company, Chicago 16, Ill.	270
Rada Products Co., Chicago 12, Illinois	482
Radio Apparatus Corporation, Indianapolis 3, Ind.	702
Radio Condenser Company, Camden 3, N. J.	273
RCA Victor Division, Radio Corporation of America, Camden, N. J.	274
The Radio Craftsmen, Inc., Chicago 16, Ill.	275
Radio Engineering Laboratories, Inc., Long Island City 1, N. Y.	276
*Radio Industries, Inc., Chicago 40, Ill.	540
*Radiomarine Corporation of America, New York 13, N. Y.	448
*Radio Materials Corporation, Chicago 13, Ill.	208
*Radio Merchandise Sales, Inc., New York 59, N. Y.	612
Radionic Controls, Inc., Herrin, Ill.	447
The Radion Corporation, Chicago 22, Ill.	700
Radio Specialty Manufacturing Co., Portland 14, Oregon	587
*Radio Television Products Corp., Grass Lake, Mich.	489
RAM Electronics, Inc., Irvington-on-Hudson, N. Y.	617
Raytheon Manufacturing Company, Newton 58, Mass.	280
Rea Magnet Wire Company, Inc., Fort Wayne 4, Ind.	281
*Red Lion Cabinet Company, Red Lion, Pa.	384
*Regal Electronics Corporation, New York 27, N. Y.	373
Rek-O-Kut Company, Inc., Long Island City 1, N. Y.	282
Remington Rand Inc., South Norwalk, Conn.	283
Remler Company, Ltd., San Francisco 10, Calif.	284
Rhode Island Insulated Wire Co., Inc., Cranston, R. I.	678
R.K.L. Electro Winding Corporation, Delevan, N. Y.	646
*Rockwell Transformer Co., Div. of Arrow Engineering Corp., Chicago 31, Ill.	716
The Rodefer Glass Company, Bellaire, Ohio	709
*Rogers Electronic Corp., New York 12, N. Y.	677
The Rola Company, Inc. (The Muter Company), Cleveland 14, Ohio	285
The Ross Manufacturing Company, Burlington, Iowa	286
Rowe Industries, Toledo 9, Ohio	580
Russell Electric Company, (Raytheon Manufacturing Company), Chicago 9, Ill.	453
*Sampsel Time Control, Inc., Spring Valley, Ill.	711
*Sampson Electric Products Co., Clinton, N. C.	518
Sangamo Electric Company, Springfield, Ill.	658
*Santay Corporation, Chicago 24, Ill.	368
*Sarkes Tarzian, Inc., Bloomfield, Indiana	684
Schneider & Marquard, Inc., Brooklyn 17, N. Y.	520
Walter L. Schott Company, Beverly Hills, Calif.	287
*Schulmerich Electronics, Inc., Sellersville, Pa.	428
*Scott Radio Laboratories, Inc., Chicago 40, Ill.	485
J. P. Seeburg Corporation, Chicago 22, Ill.	289
Sentinel Radio Corporation, Evanston, Ill.	291
Sheffco Manufacturing Co., Palisades Park, N. J.	698
Sheldon Electric Company, Div. of Allied Electric Products, Inc., Irvington 11, N. J.	636
Sherron Electronics Company, Div. of Sherron Metallic Corp., Brooklyn 6, N. Y.	293
Shoup Engineering Company, Chicago 16, Ill.	674
Shure Brothers, Incorporated, Chicago 10, Ill.	590
*Shurite Meters, New Haven 8, Conn.	484
The F. W. Sickles Company, Sub. of General Instrument Corp., Chicopee, Mass.	294
Simpson Electric Company, Chicago 44, Ill.	614
*Mark Simpson Manufacturing Co., Inc., Long Island City 3, N. Y.	295
S. M. A. Company, Chicago 25, Ill.	671
*Solar Manufacturing Corporation, Los Angeles 58, Calif.	296
Sonora Radio & Television Corp., Chicago 12, Ill.	297
*The Sparks-Withington Company, Jackson, Mich.	299
Special Products Company, Silver Spring, Md.	474
Speer Resistor Corporation, Saint Marys, Pa.	300
Sprague Electric Company, North Adams, Mass.	303
Square Root Manufacturing Corporation, Yonkers 3, N. Y.	654
Stackpole Carbon Company, St. Marys 3, Pa.	304
*Stamford Transformers, Inc., Stamford, Conn.	398
*Standard Coil Products Co., Inc., Chicago 39, Ill.	305
*Standard Condenser Company, Chicago 47, Ill.	710
*Standard Electrical Products Co., Dayton 2, Ohio	668
Standard Electronics Corporation, New York 18, N. Y.	694
Standard Piezo Company, Carlisle, Pa.	501
Standard Transformer Corporation, Chicago 18, Ill.	306
*Standard Winding Company, Newburgh, N. Y.	550
*Stanwyck Winding Company, Newburgh, N. Y.	574
The Staver Company Incorporated, Brooklyn 1, N. Y.	604
Stephens Manufacturing Corp., Culver City, Calif.	544
Stevens Wire Insulating Company, Chicago 30, Ill.	597
Stewart-Warner Electric, Div. of Stewart-Warner Corporation, Chicago 14, Ill.	307
*Stoddart Aircraft Radio Co., Hollywood 38, Calif.	369
Stromberg-Carlson Company, Rochester 3, N. Y.	308
Stupakoff Ceramic & Mfg. Co., Latrobe, Pa.	309
Super Electric Products Corp., Newark 5, N. J.	403
Superior Tube Company, Norristown, Pa.	310
Supreme, Incorporated, Greenwood, Miss.	311
Surprenant Mfg. Co., Boston 8, Mass.	624
Sylvania Electric Products Inc., Emporium, Pa.	312
Symphonic Radio and Electronic Corp., Cambridge 42, Mass.	351
Synthane Corporation, Oaks, Pa.	313
Talk-A-Phone Co., Chicago 23, Ill.	132
Taylor Tubes, Inc., Chicago 47, Ill.	713
*Tech-Master Products Company, New York 13, N. Y.	679
Technology Instrument Corporation, Acton, Mass.	715
Tele King Corporation, New York 1, N. Y.	583
Telequip Radio Company, Chicago 8, Ill.	454
*Teleradio Engineering Corporation, Wilkes Barre, Pa.	357
Tele-Tone Radio Corporation, New York 19, N. Y.	347
Tel-Instrument Co., Inc., East Rutherford, N. J.	536
*TELvision Laboratories, Inc., Chicago 44, Ill.	608
*Templetone Radio Mfg. Corp., New London, Conn.	317
*Testing Instruments, Inc., Dayton 4, Ohio	463
*Thomas & Skinner Steel Products Co., Indianapolis 7, Ind.	318
Thomas Electronics, Inc., Passaic, N. J.	672
*Ticon Inc., Bridgeport, Conn.	690
*Todd Products Co., Inc., Mt. Vernon, N. Y.	634
*Todd-Tran Corp., Mt. Vernon, N. Y.	635
*B. J. Toegel, Inc., Plainfield, N. J.	548

Company	Code No.
Trad Television Corporation, Asbury Park, N. J.	688
Trav-Ler Radio Corporation, Chicago 6, Ill.	320
Triplett Electrical Instrument Co., Bluffton, Ohio	321
Triwec Transformer Company, Chicago 18, Ill.	524
Tung-Sol Lamp Works, Inc., Newark 4, N. J.	322
The Turner Company, Cedar Rapids, Iowa	696
*T. V. Products Corporation, Paterson 3, N. J.	618
*The Ucinite Company, Newtonville, Mass.	381
*United-Carr Fastener Corporation, Cambridge 42, Mass.	370
United Condenser Corporation, New York 54, N. Y.	516
United Electronics Company, Newark 2, N. J.	323
*United States Radium Corporation, New York 7, N. Y.	324
*United Transformer Corporation, New York 13, N. Y.	418
*United Wood Specialty Mfg. Co., Fall River, Mass.	379
Valpey Crystal Corporation, Holliston, Mass.	527
Vokar Corporation, Dexter, Mich.	168
John Volkert Metal Stampings Inc., Queens Village, Long Island, N. Y.	507
*Waldom Electronics, Inc., Chicago 10, Ill.	555
Wm. T. Wallace Mfg. Co., Inc., Peru, Ind.	330
*Ward Leonard Electric Co., Mount Vernon, N. Y.	532
Ward Products Corporation, Division of the Gabriel Company, Cleveland 3, Ohio	831
*Warwick Manufacturing Corporation, Chicago 44, Ill.	332
Waterman Products Company, Inc., Philadelphia 25, Pa.	431
*Webster-Chicago Corporation, Chicago 39, Ill.	375
Weller Electric Corporation, Easton, Pa.	662
Wells-Gardner & Co., Chicago 39, Ill.	334
Wm. H. Welsh Co., Inc., Chicago 16, Ill.	335
*Wesco Electric Company Inc., Chicago 30, Ill.	553
Western Electric Company, Inc., New York 5, N. Y.	336
Westinghouse Electric Corporation, Baltimore 3, Md.	337
Weston Electrical Instrument Corp., Newark 5, N. J.	338
*The Wheeler Insulated Wire Company, Inc., Waterbury 20, Conn.	392
Wheeler Laboratories, Inc., Great Neck, N. Y.	529
*Wilcox Electric Company, Inc., Kansas City 1, Mo.	339
Wilder Manufacturing Corp., Herrin, Ill.	449
Wind Turbine Company, West Chester, Pa.	653
Winsted Division, Hudson Wire Company, Winsted, Conn.	666
Wirt Company, Philadelphia 44, Pa.	406
W. M. C. Inc., Chicago 47, Ill.	584
Woodward-Schumacher Electric Corporation, Chicago 22, Ill.	606
The Workshop Associates Incorporated, Needham Heights 94, Mass.	397
Wright Zimmerman, Inc., New Brighton, Minn.	683
Zenith Optical Company, Huntington 19, W. Va.	621
Zenith Radio Corporation, Chicago 39, Ill.	343

NUMERICAL LIST

RTMA Production Source Code Symbols

January 1, 1951

(* Indicates non-members)

Code No.	Company
101	*Admiral Corporation, Chicago 47, Ill.
102	Aerovox Corporation, New Bedford, Mass.
105	Air King Products Company, Inc., Div. of Hytron Radio & Electronics Corp., Brooklyn 32, N. Y.
106	Allen-Bradley Company, Milwaukee 4, Wis.
107	The Alliance Manufacturing Co., Alliance, Ohio
109	American Condenser Company, Chicago 40, Ill.
110	All Star Products, Inc., Defiance, Ohio
111	Amperex Electronic Corporation, Brooklyn 1, N. Y.
112	Amy, Aceves & King, Inc., New York 18, N. Y.
113	Andrea Radio Corporation, Long Island City 1, N. Y.
115	A. R. F. Products, Inc., River Forest, Ill.
116	The Arnold Engineering Company, Sub. of Allegheny Ludlum Steel Corp., Marengo, Ill.
118	Audio-Tone Oscillator Company, Bridgeport 3, Conn.
119	Automatic Manufacturing Corp., Newark 4, N. J.
120	Automatic Radio Mfg. Co., Inc., Boston 15, Mass.
122	The Bead Chain Manufacturing Co., Bridgeport 5, Conn.
124	Belmont Radio Corporation (Raytheon Manufacturing Co.), Chicago 39, Ill.
125	Bendix Radio, Division of Bendix Aviation Corporation, Baltimore 4, Md.
126	Bentley, Harris Manufacturing Co., Conshohocken, Pa.
128	Bliley Electric Company, Erie, Pa.
130	The William Brand and Co., Inc., Willimantic, Conn.
132	Talk-A-Phone Co., Chicago 23, Ill.
133	C. F. Cannon Co., Springwater, N. Y.
134	Globe-Union Inc., Centralab Division, Milwaukee 1, Wis.
135	Chicago Condenser Corporation, Chicago 47, Ill.
136	Chicago Molded Products Corp., Chicago 51, Ill.
137	Chicago Telephone Supply Corp., Elkhart, Ind.
138	Chicago Transformer Division, Essex Wire Corporation, Chicago 18, Ill.
139	Cinch Manufacturing Corporation, Chicago 24, Ill.
140	Clarostat Mfg. Co., Inc., Dover, New Hampshire
141	*Coil Engineering & Mfg. Co., Inc., Roanoke, Ind.
142	Colonial Radio Corporation (Sylvania Electric Products Inc.), Buffalo 7, N. Y.
145	*Consolidated Radio Products Co., Chicago 10, Ill.
146	Continental Carbon Inc., Cleveland 11, Ohio
147	Continental Electric Company, Geneva, Ill.
148	Corning Glass Works, Corning, N. Y.
149	Cornish Wire Company, Inc., New York 7, N. Y.
150	Crescent Industries, Inc., Chicago 41, Ill.
151	Croname, Incorporated, Chicago 13, Ill.
152	Crosley Division, Avco Manufacturing Corporation, Cincinnati 25, Ohio
155	DeWald Radio Mfg. Corp., Long Island City 1, N. Y.
156	Wilbur B. Driver Company, Newark 4, N. J.
157	*Dumont Electric Corporation, New York 34, N. Y.
158	Allen B. DuMont Laboratories, Inc., Clifton, N. J.
159	*DX Radio Products Company, Inc., Chicago 47, Ill.
160	Hugh H. Eby, Inc., Philadelphia 44, Pa.
161	Eckstein Radio & Television Co., Minneapolis 6, Minn.
162	Eitel-McCullough, Inc., San Bruno, Calif.
163	Electrical Reactance Corporation, Franklinville, N. Y.
164	The Electro Motive Mfg. Co., Inc., Willimantic, Conn.
166	*Chicago Electronic Engineering Company, Inc., Chicago 47, Ill.
168	Vokar Corporation, Dexter, Michigan
170	Electronic Tube Corporation, Philadelphia 18, Pa.
171	Emerson Radio & Phonograph Corp., New York 11, N. Y.
172	Ensign Coil Company, Chicago 23, Ill.
173	Erie Resistor Corporation, Erie, Pa.
174	Espey Manufacturing Company, Inc., New York 21, N. Y.
175	*Essex Wire Corporation, Fort Wayne 6, Ind.
176	Fada Radio and Electric Co., Inc., Belleville, N. J.
177	Capehart-Farnsworth Corporation, Fort Wayne 1, Ind.
178	John E. Fast & Company, Chicago 41, Ill.
179	Federal Telephone & Radio Corp., Clifton, N. J.
180	*Felt Products Manufacturing Co., Chicago 7, Ill.
182	A. W. Franklin Mfg. Corp., Long Island City 1, N. Y.
183	Freed Radio Corporation, New York 13, N. Y.
185	Motorola Inc., Chicago 51, Ill.
187	*Gates Radio Company, Quincy, Ill.
188	General Electric Company, Syracuse 1, N. Y.
189	General Electronics, Inc., Paterson 3, N. J.
190	The General Industries Company, Elyria, Ohio
191	General Instrument Corporation, Elizabeth 3, N. J.
192	General Laminated Products, Inc., Chicago 8, Ill.
193	General Magnetic Corporation, Detroit 34, Mich.
194	General Radio Company, Cambridge 39, Mass.
196	Gits Molding Corporation, Chicago 44, Ill.
197	The Fred Goat Co., Inc., Brooklyn 17, N. Y.
198	Edwin I. Guthman & Company, Inc., Chicago 7, Ill.
199	The Hallicrafters Company, Chicago 24, Ill.
204	Hawley Products Company, St. Charles, Ill.
205	Haydu Brothers, Plainfield, N. J.
207	Hoffman Radio Corporation, Los Angeles 7, Calif.
208	*Radio Materials Corporation, Chicago 13, Ill.
210	Hytron Radio & Electronics Corp., Salem, Mass.
211	The Indiana Steel Products Company, Chicago 2, Ill.
214	International Resistance Company, Philadelphia 8, Pa.
215	Irvington Varnish & Insulator Co., Irvington 11, N. J.
216	Jackson Electrical Instrument Co., Dayton 1, Ohio
217	Jackson Industries, Inc., Chicago 15, Ill.
218	Jefferson Electric Company, Bellwood, Ill.
219	*Jefferson-Travis Incorporated (Emerson Radio & Phonograph Corp.), New York 11, N. Y.
220	Jensen Manufacturing Company, Div. of The Muter Company, Chicago 38, Ill.
221	J. F. D. Manufacturing Co., Inc., Brooklyn 4, N. Y.
222	E. F. Johnson Company, Waseca, Minn.
223	Kerrigan Lewis Manufacturing Co., Chicago 51, Ill.
224	Kester Solder Company, Chicago 39, Ill.
225	King Laboratories, Inc., Syracuse 4, N. Y.
228	Lenz Electric Manufacturing Co., Chicago 47, Ill.
230	Littelfuse, Incorporated, Chicago 40, Ill.
231	Machlett Laboratories, Incorporated, Springdale, Conn.
232	The Magnavox Company, Fort Wayne 4, Ind.
235	P. R. Mallory & Co., Inc., Indianapolis 6, Ind.
236	Measurements Corporation, Boonton, N. J.
239	*Merit Transformer Corp., Chicago 40, Ill.
240	Micamold Radio Corporation, Brooklyn 6, N. Y.
241	*Micro Switch Division (First Industrial Corporation), Freeport, Ill.
242	James Millen Manufacturing Co., Inc., Malden 48, Mass.

Code No.	Company
244	The Muter Company, Chicago 5, Ill.
245	National Company, Inc., Malden 48, Mass.
246	National Fabricated Products, Inc., Chicago 47, Ill.
247	National Union Radio Corporation, Orange, N. J.
248	Arvin Industries, Inc., Columbus, Ind.
249	Oak Mfg. Co., Chicago 10, Ill.
250	The Ohio Carbon Company, Cleveland 11, Ohio
251	Ohmite Manufacturing Company, Chicago 44, Ill.
252	Operadio Manufacturing Co., St. Charles, Ill.
254	Packard-Bell Company, Los Angeles 64, Calif.
256	*Panelyte Division, St. Regis Paper Co., New York 17, N. Y.
257	Parisian Novelty Company, Chicago 9, Ill.
258	Permoflux Corporation, Chicago 39, Ill.
259	Permo, Incorporated, Chicago 26, Ill.
260	Philco Corporation, Philadelphia 34, Pa.
262	Philmore Manufacturing Co., Inc., New York 3, N. Y.
264	Pilot Radio Corporation, Long Island City 1, N. Y.
267	Premax Products Division, Chisholm-Ryder Co., Inc., Niagara Falls, N. Y.
269	Quality Hardware and Machine Division, Continental Copper & Steel Industries, Inc., Chicago 26, Ill.
270	Quam-Nichols Company, Chicago 16, Ill.
273	Radio Condenser Company, Camden 3, N. J.
274	RCA Victor Division, Radio Corporation of America, Camden, N. J.
275	The Radio Craftsmen, Inc., Chicago 16, Ill.
276	Radio Engineering Laboratories, Inc., Long Island City 1, N. Y.
278	Brunswick Radio, Division of Radio & Television, Inc., New York 16, N. Y.
280	Raytheon Manufacturing Company, Newton 58, Mass.
281	Rea Magnet Wire Company, Inc., Fort Wayne 4, Ind.
282	Rek-O-Kut Company, Inc., Long Island City 1, N. Y.
283	Remington Rand Inc., South Norwalk, Conn.
284	Remler Company, Ltd., San Francisco 10, Calif.
285	The Rola Company, Inc. (The Muter Company), Cleveland 14, Ohio
286	The Ross Manufacturing Company, Burlington, Iowa
287	Walter L. Schott Company, Beverly Hills, Calif.
289	J. P. Seeburg Corporation, Chicago 22, Ill.
291	Sentinel Radio Corporation, Evanston, Ill.
293	Sherron Electronics Company, Div. of Sherron Metallic Corp., Brooklyn 6, N. Y.
294	The F. W. Sickles Company, Sub. of General Instrument Corp., Chicopee, Mass.
295	*Mark Simpson Manufacturing Co., Inc. Long Island City 3, N. Y.
296	*Solar Manufacturing Corporation, Los Angeles 58, Calif.
297	Sonora Radio & Television Corp., Chicago 12, Ill.
299	*The Sparks-Withington Company, Jackson, Mich.
300	Speer Resistor Corporation, Saint Marys, Pa.
303	Sprague Electric Company, North Adams, Mass.
304	Stackpole Carbon Company, St. Marys 3, Pa.
305	*Standard Coil Products Co., Inc., Chicago 39, Ill.
306	Standard Transformer Corporation, Chicago 18, Ill.
307	Stewart-Warner Electric, Div. of Stewart-Warner Corporation, Chicago 14, Ill.
308	Stromberg-Carlson Company, Rochester 3, N. Y.
309	Stupakoff Ceramic & Mfg. Co., Latrobe, Pa.
310	Superior Tube Company, Norristown, Pa.
311	Supreme, Incorporated, Greenwood, Miss.
312	Sylvania Electric Products Inc., Emporium, Pa.
313	Synthane Corporation, Oaks, Pa.
317	*Templetone Radio Mfg. Corp., New London, Conn.
318	*Thomas & Skinner Steel Products Co., Indianapolis 7, Ind.
320	Trav-Ler Radio Corporation, Chicago 6, Ill.
321	Triplett Electrical Instrument Co., Bluffton, Ohio
322	Tung-Sol Lamp Works, Inc., Newark 4, N. J.
323	United Electronics Company, Newark 2, N. J.
324	*United States Radium Corporation, New York 7, N. Y.
330	Wm. T. Wallace Mfg. Co., Inc., Peru, Ind.
331	Ward Products Corporation, Division of the Gabriel Company, Cleveland 3, Ohio
332	*Warwick Manufacturing Corporation, Chicago 44, Ill.
334	Wells-Gardner & Co., Chicago 39, Ill.
335	Wm. H. Welsh Co., Inc., Chicago 16, Ill.
336	Western Electric Company, Inc., New York 5, N. Y.
337	Westinghouse Electric Corporation, Baltimore 3, Md.
338	Weston Electrical Instrument Corp., Newark 5, N. J.
339	*Wilcox Electric Company, Inc., Kansas City 1, Mo.
343	Zenith Radio Corporation, Chicago 39, Ill.
344	*Argus, Incorporated, Ann Arbor, Michigan
345	The Astatic Corporation, Conneaut, Ohio
347	Tele-Tone Radio Corporation, New York 19, N. Y.
351	Symphonic Radio and Electronic Corp., Cambridge 42, Mass.
352	*Magnetic Windings Company, Easton, Pa.
357	*Teleradio Engineering Corporation, Wilkes Barre, Pa.
360	*Gavitt Mfg. Co., Inc., Brookfield, Mass.
366	New York Transformer Co., Inc., Alpha, N. J.
367	National Moldite Company, Hillside 5, N. J.
368	*Santay Corporation, Chicago 24, Ill.
369	*Stoddart Aircraft Radio Co., Hollywood 38, Calif
370	*United-Carr Fastener Corporation, Cambridge 42, Mass.
371	*Best Manufacturing Co., Inc., Irvington 11, N. J.
372	*Holyoke Wire and Cable Corporation, Holyoke, Mass.
373	*Regal Electronics Corporation, New York 27, N. Y.
374	*Harry A. Prock Cabinet Company, Glenside, Pa.
375	*Webster-Chicago Corporation, Chicago 39, Ill.
376	Hazeltine Electronics Corporation, Little Neck, L. I., N. Y.
379	*United Wood Specialty Mfg. Co., Fall River, Mass.
381	*The Ucinite Company, Newtonville, Mass.
384	*Red Lion Cabinet Company, Red Lion, Pa.
385	*Dearborn Glass Company, Chicago 8, Ill.
391	Altec Lansing Corporation, Beverly Hills, Calif.
392	*The Wheeler Insulated Wire Company, Inc., Waterbury, 20, Conn.
394	*Foster Transformer Company, Cincinnati 23, Ohio
395	*Permoflux Corporation, Glendale 5, Calif.
396	General Cement Mfg. Co., Rockford, Ill.
397	The Workshop Associates Incorporated, Needham Heights 94, Mass.
398	*Stamford Transformers, Inc., Stamford, Conn.
402	Andrew Corporation, Chicago 19, Ill.
403	Super Electric Products Corp., Newark 5, N. J.
406	Wirt Company, Philadelphia 44, Pa.
409	British Industries Corporation, New York 13, N. Y.
413	*Acme Electric Corporation, Cuba, N. Y.
418	*United Transformer Corporation, New York 13, N. Y.
423	North American Philips Company, Inc., New York 17, N. Y.
424	*Milwaukee Stamping Company, Milwaukee 14, Wis.
425	*Essex Electronics, Berkeley Heights, N. J.
427	Communication Measurements Laboratory, Inc., New York 6, N. Y.
428	*Schulmerich Electronics, Inc., Sellersville, Pa.
430	Camburn, Inc., Woodside, Long Island, N. Y.
431	Waterman Products Company, Inc., Philadelphia 25, Pa.
433	Cleveland Electronics, Inc., Cleveland 3, Ohio
435	Plastoid Corporation, Hamburg, N. J.
438	The Gudeman Company, Chicago 10, Ill.
439	Collins Radio Company, Cedar Rapids, Iowa
440	Cannon Electric Development Co., Division of Cannon Manufacturing Corp., Los Angeles 31, Calif.
442	J-B-T Instruments, Inc., New Haven 8, Conn.
445	*Mississippi Products, Inc., Jackson, Miss.
446	Good-All Electric Mfg. Co., Ogallala, Nebr.
447	Radionic Controls, Inc., Herrin, Ill.
448	*Radiomarine Corporation of America, New York 13, N. Y.
449	Wilder Manufacturing Corp., Herrin, Ill.
450	Columbus Process Co., Inc., Columbus, Ind.
452	Empire Coil Company, Inc., New Rochelle, N. Y.
453	Russell Electric Company (Raytheon Manufacturing Company), Chicago 9, Ill.
454	Telequip Radio Company, Chicago 8, Ill.
455	Dynavox Corporation, Long Island City 1, N. Y.
457	Herlec Corporation, Sub. of Sprague Electric Co., Milwaukee 3, Wis.
459	*General Communication Company, Boston 15, Mass.
461	Barker & Williamson, Inc., Upper Darby, Pa.
463	*Testing Instruments, Inc., Dayton 4, Ohio
464	*Q. L. C. Corporation, Summit, N. J.
465	Oxford Electric Corporation, Chicago 15, Ill.
466	Delco Radio Division, General Motors Corporation, Kokomo, Ind.
467	Grigsby-Allison Company, Inc., Arlington Heights, Ill
472	*Pyramid Electric Company, North Bergen, N. J.
474	Special Products Company, Silver Spring, Md.
475	*Glass Products Company, Chicago 37, Ill.
479	The National Varnished Products Corp., Woodbridge, N. J.
481	Harnett Electric Corporation, Port Washington, N. Y.
482	Rada Products Co., Chicago 12, Ill.
484	*Shurite Meters (J-B-T Instruments, Inc.), New Haven 8, Conn.
485	*Scott Radio Laboratories, Inc., Chicago 40, Ill.
487	*Hudson Electronics Corporation, Mount Vernon, N. Y.
489	*Radio Television Products Corp., Grass Lake, Mich.
494	Fidelity Products Co., Inc., So. Orange, N. J.
501	Standard Piezo Company, Carlisle, Pa.
503	Caledonia Electronics & Transformer Corp., Caledonia, N. Y.
504	The James Knights Company, Sandwich, Ill.
505	Precision Apparatus Company, Inc., Elmhurst, L. I., N. Y.
507	John Volkert Metal Stampings, Inc., Queens Village, Long Island, N. Y.

Code No.	Company
508	The Hickok Electrical Instrument Co., Cleveland 8, O.
511	*The Joyner Corporation, Chicago 44, Ill.
514	*Audio Electric Company, Chicago 26, Ill.
515	Electronic Components Corporation, Chicago 10, Ill.
516	United Condenser Corporation, New York 54, N. Y.
517	Audak Company, Inc., New York 18, N. Y.
518	*Sampson Electric Products Co., Clinton, N. C.
519	American Volume Control Corp., New York 6, N. Y.
520	Schneider & Marquard, Inc., Brooklyn 17, N. Y.
524	Triwec Transformer Company, Chicago 18, Ill.
525	Crucible Steel Company of America, New York 17, N. Y.
527	Valpey Crystal Corporation, Holliston, Mass.
528	Columbus Electronics Corporation, Yonkers, N. Y.
529	Wheeler Laboratories, Inc., Great Neck, N. Y.
530	Clippard Instrument Laboratory, Inc., Cincinnati 14, Ohio
532	*Ward Leonard Electric Co., Mount Vernon, N. Y.
535	Hedco Manufacturing Corporation, Mt. Vernon, N. Y.
536	Tel-Instrument Co., Inc., East Rutherford, New Jersey
539	Powdered Metal Products Corporation of America, Franklin Park, Ill.
540	*Radio Industries, Inc., Chicago 40, Ill.
541	Industrial Television, Inc., Clifton, N. J.
544	Stephens Manufacturing Corp., Culver City, Calif.
545	Electronic Enterprises, Inc., Newark 4, N. J.
547	*Anaconda Wire & Cable Company, Hastings-On-Hudson 6, N. Y.
548	*B. J. Toegel, Inc., Plainfield, N. J.
549	*Mid-West Coil & Transformer Co., Chicago 14, Ill.
550	*Standard Winding Company, Newburgh, N. Y.
551	American Television & Radio Co., St. Paul 1, Minn.
552	Otis Radio & Electric Corp., Hawarden, Iowa
553	*Wesco Electric Company, Inc., Chicago 30, Ill.
554	American Phenolic Corporation, Chicago 50, Ill.
555	*Waldom Electronics, Inc., Chicago 10, Ill.
556	*The Halldorson Company, Chicago 40, Ill.
557	Electronic Products Company, Mt. Vernon, N. Y.
561	*Farmers Engineering & Mfg. Co., Pittsburgh 21, Pa.
562	Polorad Electronics Corp., Brooklyn 11, N. Y.
563	J. W. Davis & Company, Dallas 9, Texas
569	*Electrical Utilities Company, La Salle, Ill.
570	*Leonard Electric Products Co., Inc., Brooklyn 19, N. Y.
571	*General Cable Corporation, New York 17, N. Y.
572	*F. & V. Coil Winding Corporation, Newark 5, N. J.
573	Alcon Metal Products, Inc., Chicago 47, Ill.
574	*Stanwyck Winding Company, Newburgh, New York
575	*Heppner Manufacturing Company, Round Lake, Ill.
576	*Ellar Woodcraft Corp., New York 1, N. Y.
577	The La Pointe Plascomold Corp., Unionville, Conn.
579	Belden Manufacturing Company, Chicago 44, Ill.
580	Rowe Industries, Toledo 9, Ohio
581	Aircraft-Marine Products Inc., Harrisburg, Pa.
583	Tele King Corporation, New York 1, N. Y.
584	W. M. C. Inc., Chicago 47, Ill.
585	*American Insulator Corporation, New Freedom, Pa.
586	Drake Manufacturing Company, Chicago 22, Ill.
587	Radio Specialty Manufacturing Co., Portland 14, Ore.
588	Barnes Metal Products Company, Chicago 23, Ill.
589	David Bogen Co., Inc., New York 12, N. Y.
590	Shure Brothers, Inc., Chicago 10, Ill.
592	Perfection Electric Company, Chicago 16, Ill.
593	Kip Electronics Corporation, New York 14, N. Y.
594	Kobzy Tool Company, Chicago 22, Ill.
596	*The Gramer Transformer Company, Chicago 39, Ill.
597	Stevens Wire Insulating Company, Chicago 39, Ill.
598	*DeLuxe Coils, Inc., Wabash, Ind.
599	*Electro-Connector Corporation, Philadelphia 22, Pa.
603	*Eltran Corp., St. Anne, Ill.
604	The Staver Company Incorporated, Brooklyn 1, N. Y.
606	Woodward-Schumacher Electric Corporation, Chicago 22, Ill.
607	Consolidated Wire & Associated Companies, Chicago 16, Ill.
608	*TELvision Laboratories, Inc., Chicago 44, Ill.
609	Markel Electric Products, Inc., Buffalo 3, N. Y.
610	Carter Parts Company, Chicago 10, Ill.
612	*Radio Merchandise Sales, Inc., New York 59, N. Y.
614	Simpson Electric Company, Chicago 44, Ill.
616	Illinois Condenser Co., Chicago 22, Ill.
617	RAM Electronics, Inc., Irvington-On-Hudson, N. Y.
618	*T. V. Products Corporation, Paterson 3, N. J.
619	*Bowers Battery and Spark Plug Co., Reading, Pa.
620	Kay Electric Company, Pine Brook, N. J.
621	Zenith Optical Company, Huntington 19, W. Va.
622	*Mifflinburg Body Works, Inc., Mifflinburg, Penna.
623	Anchor Radio Corporation, Chicago 23, Ill.
624	Surprenant Mfg. Co., Boston 8, Mass.
625	*The Orsenigo Company, Inc., Westerly, R. I.
628	Davis Electric Company, Cape Girardeau, Mo.
629	*Anchor Plastics Company, New York 13, N. Y.
631	Pickering and Company, Inc., Oceanside, N. Y.
632	*El-Rad Manufacturing Co., Chicago 13, Ill.
633	American Television, Inc., Chicago 5, Ill.
634	*Todd Products Co., Inc., Mt. Vernon, N. Y.
635	*Todd-Tran Corp., Mt. Vernon, N. Y.
636	Sheldon Electric Company, Div. of Allied Electric Products, Inc., Irvington 11, N. J.
637	Central Coil Company, Inc., Indianapolis 22, Ind.
638	Industrial Development Engineering Associates, Inc., Indianapolis 4, Ind.
639	Johnson & Hoffman, Inc., Rockville Centre, N. Y.
640	Northern Metal Products Company, Chicago 24, Ill.
642	Mycalex Corporation of America, Clifton, N. J.
643	National Aeronautical Corporation, Ambler, Pa.
644	General Railway Signal Company, Rochester 2, N. Y.
645	*Alamo Television & Radio Co., San Antonio, Texas
646	R. K. L. Electro Winding Corporation, Delevan, N. Y.
647	American Structural Products Co., Sub. of Owens-Illinois Glass Co., Toledo 1, Ohio
648	*American Radionic Co., Inc., Brooklyn 17, N. Y.
649	Electro-Voice, Inc., Buchanan, Michigan
651	*Jewel Radio Corporation, Long Island City 1, N. Y.
653	Wind Turbine Company, West Chester, Pa.
654	Square Root Manufacturing Corp., Yonkers 3, N. Y.
655	J. A. Maurer, Inc., Long Island City 1, N. Y.
656	Orsyd Company, Detroit 10, Mich.
657	Lowell Metal Products Corporation, St. Louis 7, Mo.
658	Sangamo Electric Company, Springfield, Ill.
659	John R. Hollingsworth Corporation, Clifton Heights, Pa.
660	*Electrical Assemblies, Inc., Grand Haven, Mich.
662	Weller Electric Corporation, Easton, Pa.
663	Mercury Radio & Television Corp., Chicago 5, Ill.
664	*Ideal Machine Shop, Bayshore, Long Island, N. Y.
665	Penn Transformer Corporation, Bellefonte, Pa.
666	Winsted Division, Hudson Wire Company, Winsted, Conn.
667	Arcturus Electronics, Inc., Newark 4, N. J.
668	*Standard Electrical Products Co., Dayton 2, Ohio
669	Advance Transformer Company, Chicago 40, Ill.
670	Glaser-Steers Corporation, Belleville 9, N. J.
671	S. M. A. Company, Chicago 25, Ill.
672	Thomas Electronics, Inc., Passaic, N. J.
673	Ampro Corporation, Chicago 18, Ill.
674	Shoup Engineering Company, Chicago 16, Ill.
675	Electronic Industries Inc., Springfield, Ohio
676	Penn Boiler and Burner Mfg. Corp., Lancaster, Pa.
677	*Rogers Electronic Corp., New York 12, N. Y.
678	Rhode Island Insulated Wire Co., Inc., Cranston, R. I.
679	*Tech-Master Products Company, New York 13, N. Y.
680	Conrac, Incorporated, Glendora, Calif.
681	American Lava Corporation, Chattanooga 5, Tenn.
682	*Electrical Windings, Inc., Chicago 39, Ill.
683	Wright Zimmerman, Inc., New Brighton, Minn.
684	*Sarkes Tarzian, Inc., Bloomfield, Ind.
685	General Ceramics and Steatite Corp., Keasbey, N. J.
686	H. S. Martin & Company, Evanston, Ill.
687	*Hillburn Electronic Products Co., Brooklyn 22, N. Y
688	Trad Television Corporation, Asbury Park, N. J.
689	*Aladdin Radio Industries, Chicago, Ill.
690	*Ticon Inc., Bridgeport, Conn.
691	*Pioneer Electronics Corp., Salem, Mass.
692	CELCO (Constantine Engineering Laboratories Co.), Mahwah, N. J.
693	Multi-Tron Laboratory, Chicago 44, Ill.
694	Standard Electronics Corporation, New York 18, N. Y.
695	Basler Electric Company, Highland, Ill.
696	The Turner Company, Cedar Rapids, Ia.
697	*Phalo Plastics Corporation, Worcester 8, Mass.
698	Sheffco Manufacturing Co., Palisades Park, N. J.
699	Keystone Electronics Company, Stamford, Conn.
700	The Radion Corporation, Chicago 22, Ill.
701	Forbes & Wagner, Inc., Silver Creek, N. Y.
702	Radio Apparatus Corporation, Indianapolis 3, Ind.
703	Product Development Co., Inc., Arlington, N. J.
704	Cosmic Radio Corporation, New York 59, N. Y.
705	*Ajax Condenser Co., Inc., Chicago 14, Ill.
706	Pioneer Electronics Corporation, Santa Monica, Calif.
707	*Anchor Electronics Inc., Union City, N. J.
708	Bell Sound Systems, Inc., Columbus 7, Ohio
709	The Rodefer Glass Company, Bellaire, Ohio
710	*Standard Condenser Company, Chicago 47, Ill.
711	*Sampsel Time Control, Inc., Spring Valley, Ill.
712	*Control Corporation, Minneapolis 14, Minn.
713	Taylor Tubes, Inc., Chicago 47, Ill.
714	General Vacuum Tube Corp., Ardsley, N. Y.
715	Technology Instrument Corporation, Acton, Mass.
716	*Rockwell Transformer Co. (Div. of Arrow Engineering Corp.), Chicago 31, Ill.
717	Arthur C. Ansley Mfg. Co., Doylestown, Pa.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 10 SET #127

SENTINEL MODELS
IU432, IU435, 432, 435

Sentinel Models 432, 435, IU432 and IU435 are identical to Sentinel Models covered in Photofact Folder 10 Set #127 except for the following differences.

Series YA Chassis

The YA Chassis is the same as the chassis for Model 425.

Series YB Chassis

R88 changed to 10KΩ

A 500MMF capacitor added in parallel with C73

A .005MFD capacitor added from the high side of the horizontal hold control to ground.

Series YC Chassis

Type 6CB6 tubes used in all video IF stages.

Pin 2 of V4 removed from ground.

C29 grounded to socket shield instead of to Pin 2 of V4.

A 27Ω resistor connected from Pin 2 of V4 to ground.

Pin 7 of V5 grounded to socket shield.

A jumper connected between Pins 2 and 7 of V6.

SUPPLEMENTAL RDATA TO PHOTOFACT FOLDER 21 SET #57

TELETONE MODELS
TV209, TV210, TV249

Late version productions of Tele Tone, Models TV209, TV210 and TV249 were made without centering controls, used a grounded grid amplifier in the tuner, and various components added or removed.

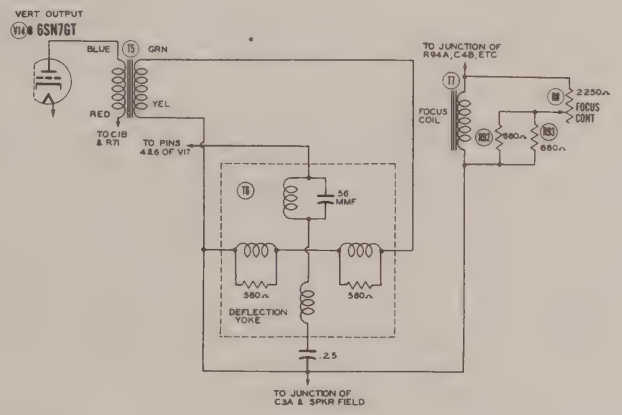
The new tuner is the same as the one used in Tele Tone Model TV208 (Folder 11 Set 90).

When the centering controls were eliminated the following parts were removed.

R6 and R7 removed.

C5A and C5B removed.

A partial schematic below shows the deflection circuit in the late version without the centering controls.



Other component changes are as follows:

L16 removed.

R37 removed.

A peaking coil was added in series with R39.

C53 is .002MFD instead of .01MFD.

C54 is .01MFD instead of .002MFD.

C76 removed.

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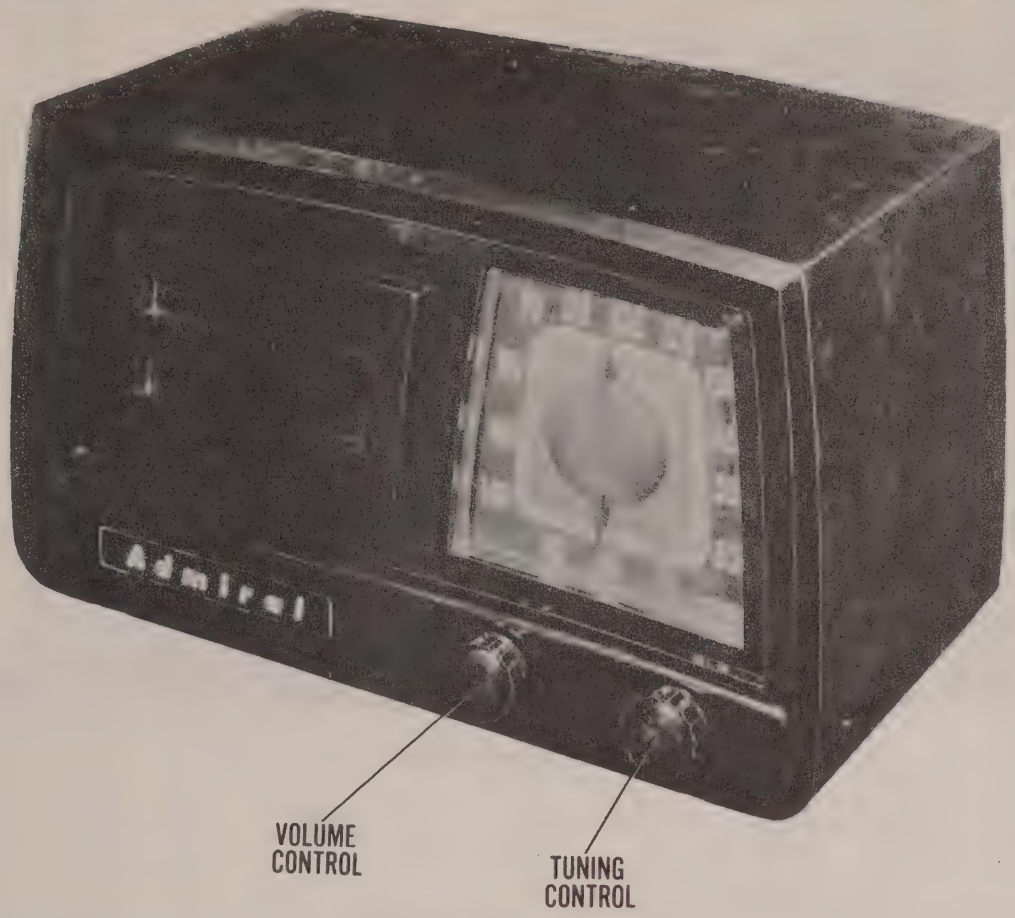

ADMIRAL
CHASSIS 5J2

ADMIRAL
CHASSIS 5J2

ADMIRAL, MODEL 5J21

TRADE NAME	Admiral, Models 5J21, 5J22, 5J23 (Ch. 5J2)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 12SA7 Converter, 12SK7 IF Amp., 12SQ7 DET.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning cap fully closed and set pointer parallel with base of dial.
Use isolation transformer if available. If not, connect a .1MFD capacitor in series with low side of signal generator and chassis.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	250MMF	High side to stator of rear section of tuning gang. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1620KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver Adjust for maximum output.
3.		Loop	1400KC	"	"	A5	"

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PARTS LIST AND DESCRIPTIONS

ADMIRAL
CHASSIS 5J2

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		ADMIRAL PART No.	STANDARD REPLACEMENT		
V1	Converter	12SA7	12SA7	8R	
V2	IF Amplifier	12SK7	12SK7	8N	
V3	Det.-AVC-AF	12SQ7	12SQ7	8Q	
V4	Power Output	50L6GT	50L6GT	7AC	
V5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	50	150	67A10	PRS15/50-30		EDL5315		TVA-2450	Filter Red
B	30	150							Filter Yellow
C2	.05	400	64B1-22	P488-05	DF-503	PTE4S5		4TM-S5	Tuning Cap. Isolation †
C3	47		65C6-79	SI47	D6-470	5W5Q5	GP1K-470	19C25	Osc. Grid Cap.
C4	.1	200	64B1-30	P288-1	DF-104	PTE4P1		2TM-P1	AVC Filter
C5	220		65C6-80	SI220	D6-221	5W5T2	GP2K-221	19C13	Diode RF Filter
C6	.01	400	64B1-25	P488-01	D6-103	PTE4S1	821-.01	4TM-S1	Audio Coupling
C7A	120		*63A5-4	SI120	*PC-70	5W5T15	GP2K-121	19C29	AF Amp. Plate
B	.005			BPD-005		PTE6D5	GP2-333-502	29C1	Audio Coupling
C	120			SI120		5W5T1	GP2K-121	19C29	Output Grid
C8	.02	400	64B1-24	P488-02	DF-203	PTE4S2		4TM-S2	Output Plate
C9	.18	200	64A2-2	P488-22		GT4P2		72P53	Line Isolation †
C10	.05	400	64B1-22	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter

† Not used in all models.
* Items C7A, C7B, C7C, R5A, and R5B are combined in one unit.

CONTROLS

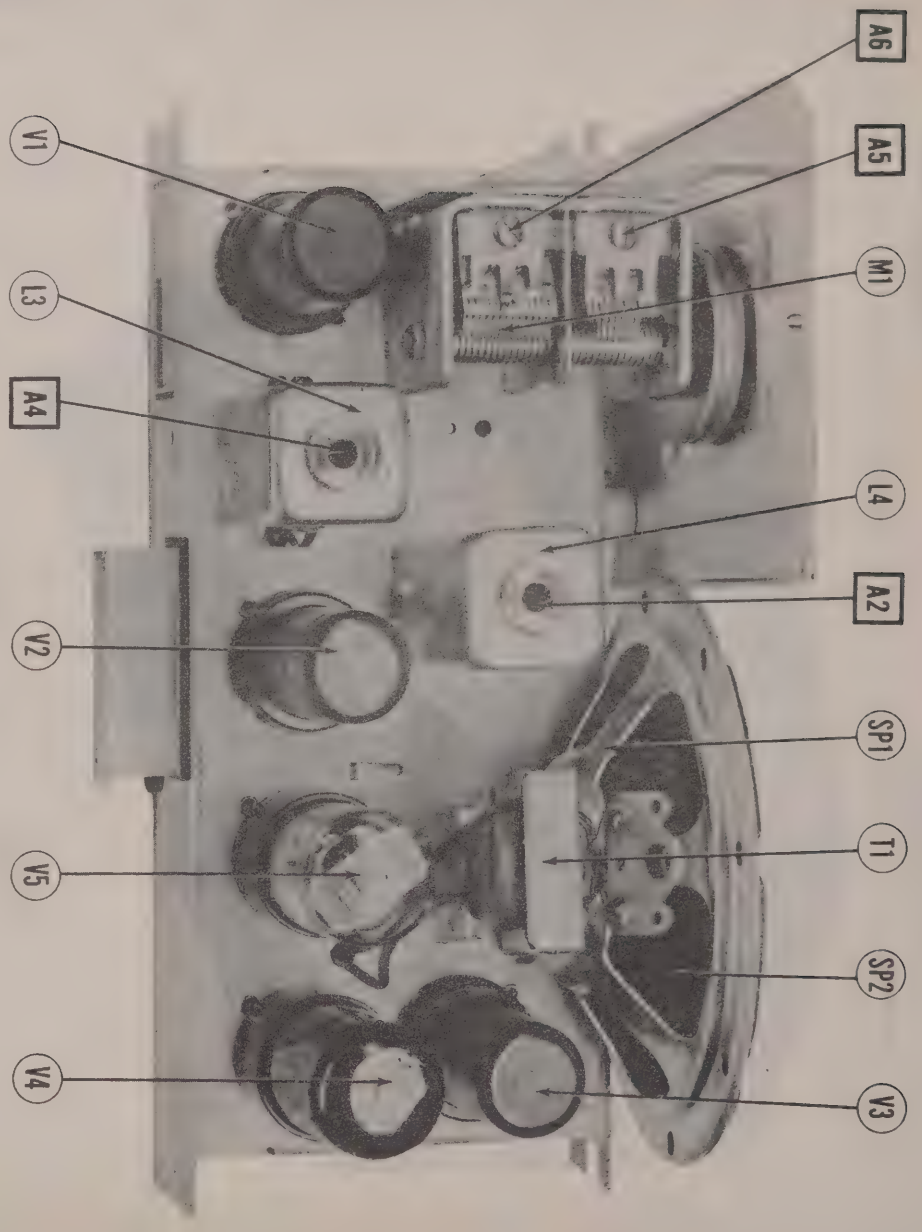
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	1Meg	½	75B1-25	Q13-137	AG-63-Z	BSK-70-S	Volume Control
B	Shaft		Not req.	Not req.	KSS-3	Not req.	Attach to R1A per instructions
C	Switch		Not req.	76-1	SWB	Not req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ADMIRAL PART No.	IRC PART No.	
R2	22KΩ	½	60B8-223	BTS-22K	Osc. Grid
R3	1Meg	½	60B8-105	BTS-1Meg	AVC Network
R4	4.7Meg	½	60B8-475	BTS-4.7Meg	AF Amp. Grid
R5A	500KΩ	½	63A5-4 *	BTS-470K	AF Amp. Plate
B	500KΩ	½		BTS-470K	Output Grid
R6	150Ω	½	60B8-151	BTS-150	Output Cathode
R7	1000Ω	1	60B28-2	BTA-1000	Filter
R8	33Ω	1	60B28-3		Surge Limiter
R9	150KΩ	½	60B8-154	BTS-150K	Line Isolation - Note

* Items R5A, R5B, C7A, C5B, and C7C are combined into one unit.
Note Not used in all models.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	1.7KΩ	3.2Ω	162Ω	.65	98A4	A-3332 ①	A-3025 ①	R0-2 ①	① Bend mounting tabs down file out slots and mount on original bracket.

SPEAKER

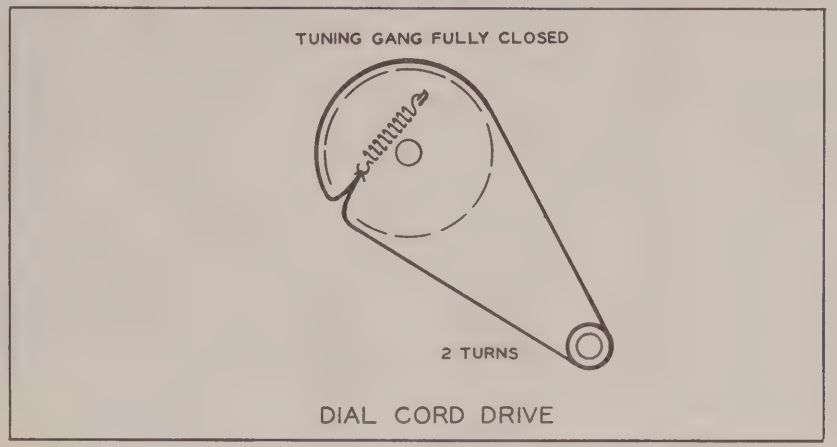
ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			ADMIRAL PART No.	JENSEN PART No.	QUAM PART No.	
SP1	FIELD	V. C. IMP.	78B26-1 ②	ST105 Model P5-X	5A1	② Includes output transformer
	PM	3.2Ω				
SP2	CONE DIA.	V. C. DIA.				
	4 11/16"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	ADMIRAL PART No.	MEISSNER PART No.	
L1	Loop Ant.	1.2Ω		69C60		
L2	Osc. Coil	6Ω		69A20-2		
L3	1st. IF Coil	24Ω	24Ω	72B50		
L4	2nd. IF Coil	24Ω	24Ω	72B51		

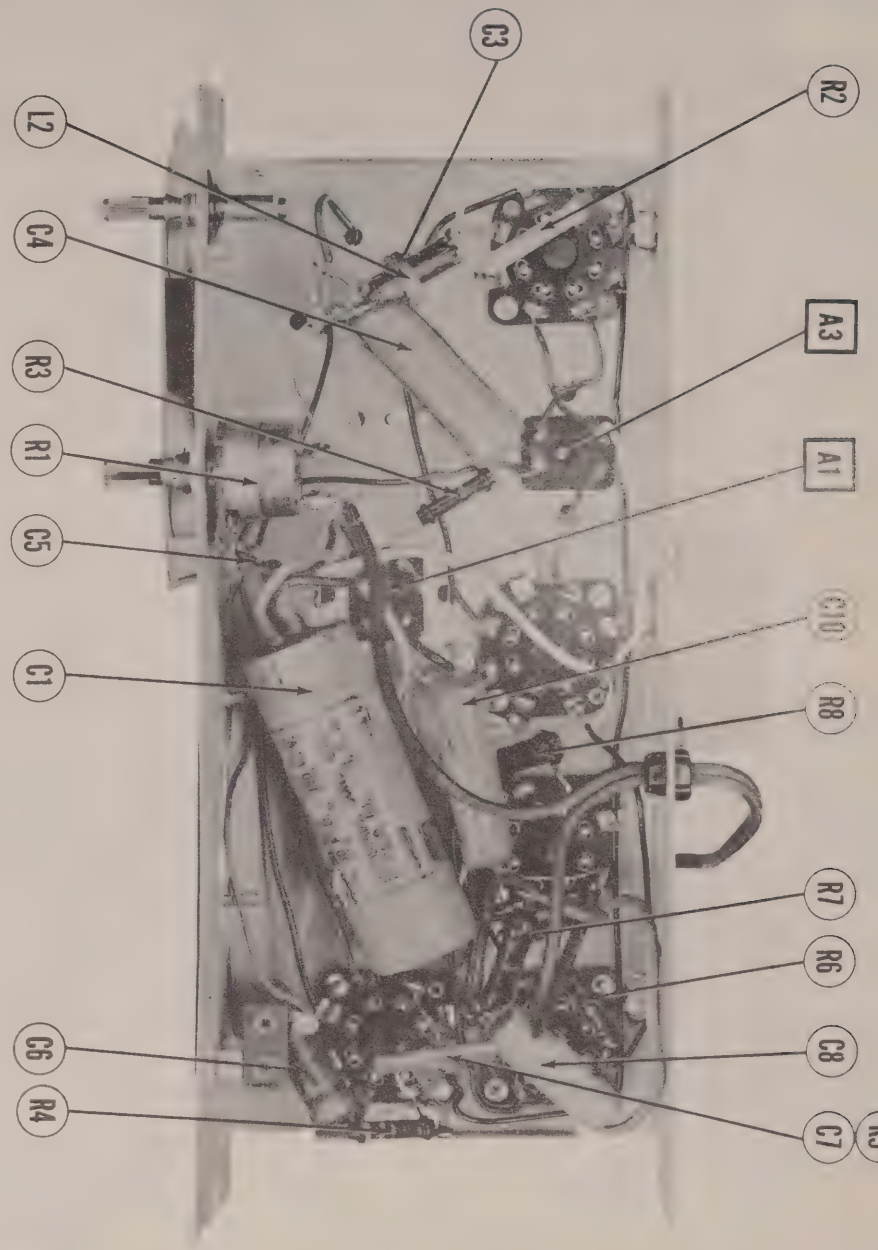
MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M1	2 Gang Var. Cap.	68B28-1	(29-458MMF, 22-157MMF)
	Cabinet	34D26-9	Model 5J21
	Cabinet	34D26-10	Model 5J22
	Cabinet	34D26-11	Model 5J23
	Dial Crystal	23B82	
	Dial Pointer	25A31-7	Model 5J21
	Dial Pointer	25A31-5	Model 5J22
	Dial Pointer	25A31-6	Model 5J23

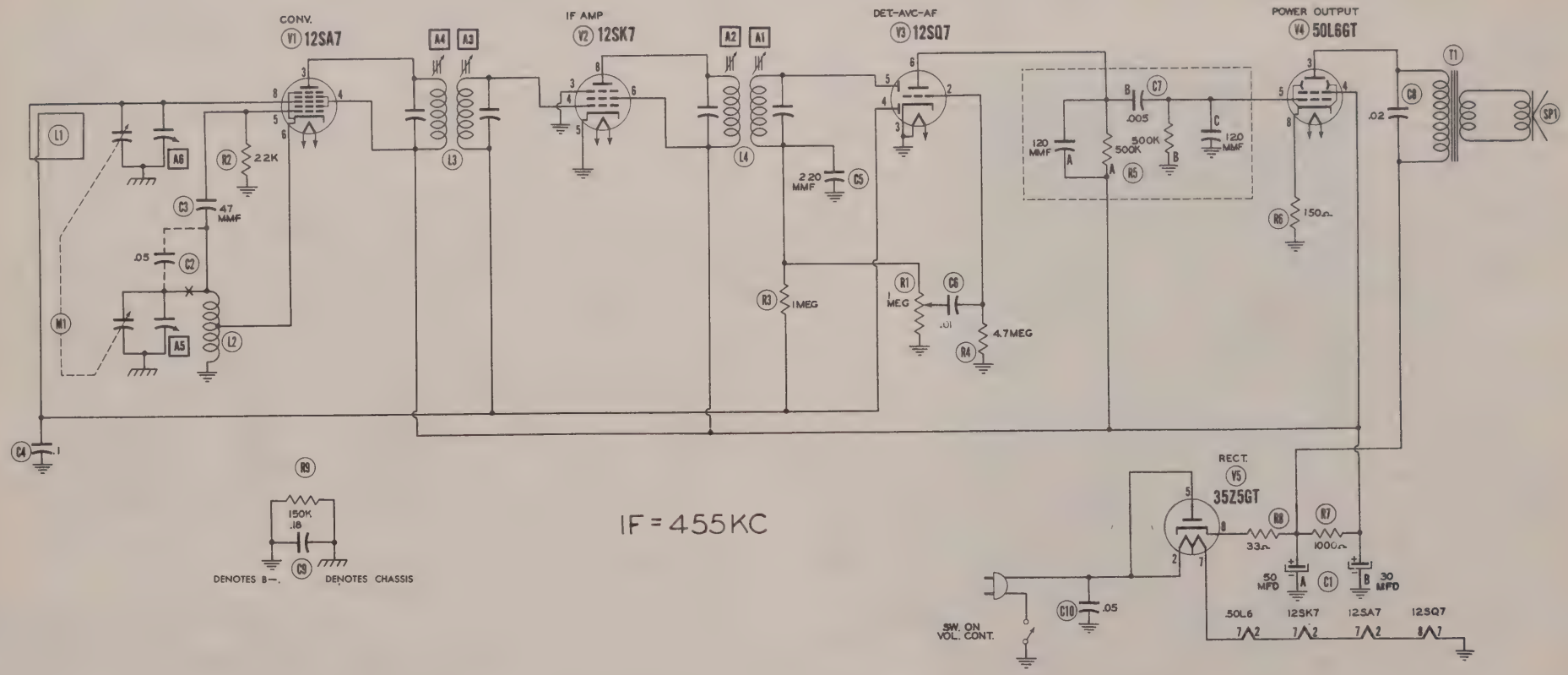


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



ADMIRAL CHASSIS 5J2



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	0V	12VAC	92VDC	92VDC	§-8.2VDC	0V	24VAC	-.5VDC
V 2	12SK7	0V	24VAC	0V	-.5VDC	0V	92VDC	36VAC	92 VDC
V 3	12SQ7	0V	-.6VDC	0V	-.5VDC	-.4VDC	50VDC	0V	12VAC
V 4	50L6GT	0V	36VAC	115VDC	92VDC	0V	120VDC	82VAC	8.2 VDC
V 5	35Z5GT	0V	117VAC	110VAC	118VDC	117VAC	120VDC	82VAC	125VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	0Ω	12Ω	†1000Ω	†1000Ω	22KΩ	.5Ω	25Ω	2Meg
V 2	12SK7	0Ω	25Ω	0Ω	2Meg	0Ω	†1000Ω	38Ω	†1000Ω
V 3	12SQ7	0Ω	5Meg	0Ω	2Meg	1Meg	†300KΩ	0Ω	12Ω
V 4	50L6GT	0Ω	38Ω	†200Ω	†1000Ω	500KΩ	900KΩ	90Ω	160Ω
V 5	35Z5GT	0Ω	125Ω	120Ω	900KΩ	125Ω	900KΩ	90Ω	900KΩ

† MEASURED FROM PIN 8 OF V5

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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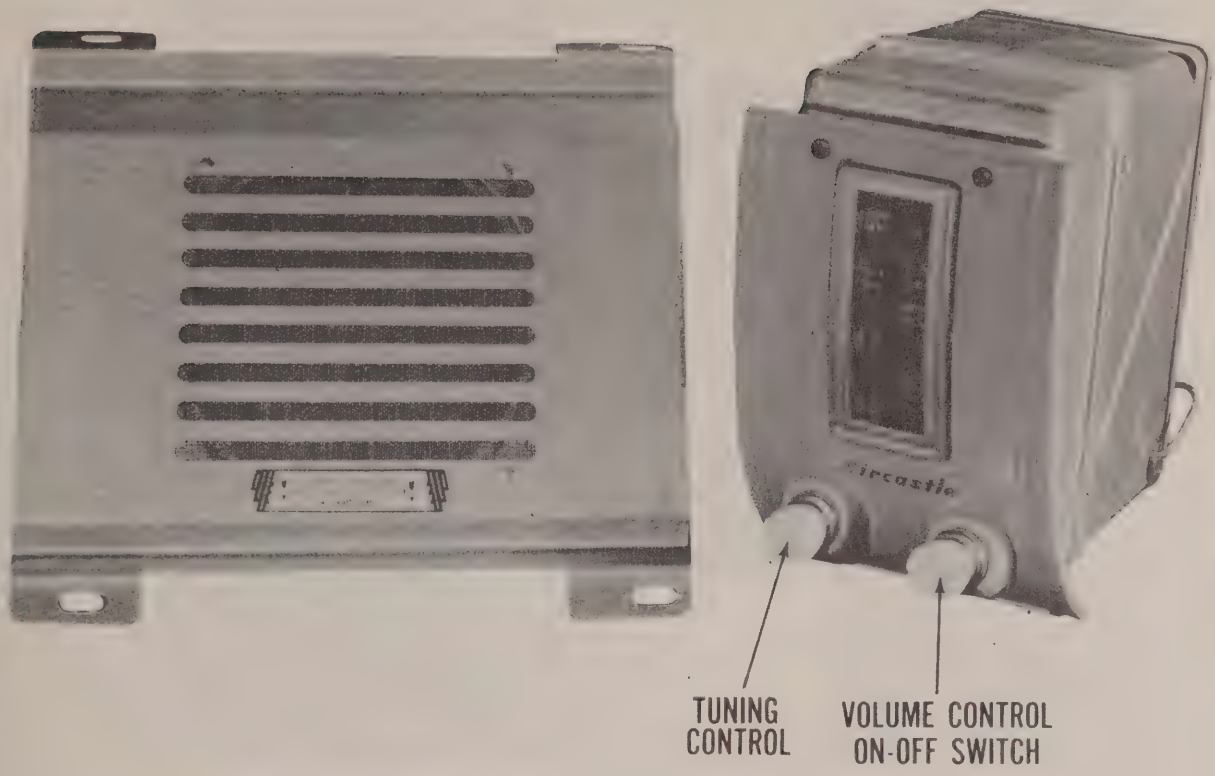
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

AIRCASTLE
MODEL C-300



AIRCASTLE
MODEL C-300

TRADE NAME	Aircastle, Model C-300
SUPPLIER	Spiegel, Inc., 1061 W. 35th. St., Chicago, Illinois.
TYPE SET	Battery Operated Custom Built Automotive Superheterodyne Receiver
TUBES (SIX)	Types 6BA6 RF Amp., 6BE6 Converter, 6BA6 IF Amp., 6AT6 Det.-AVC-AF, 6AQ5 Power Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery RATING 5.5Amp. at 6 Volts DC
TUNING RANGE—BROADCAST	538-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set lower edge of pointer carriage 1 3/8" from top edge of chassis. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid) of 6BE6 (V2). Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	100MMF	High side to antenna lead. Low side to chassis.	1600KC	"	"	A5	"
3.	100MMF	"	1400KC	Tune for max. output.	"	A6, A7	"
4.	100MMF	"	600KC	"	"	A8, A9 A10	"

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PARTS LIST AND DESCRIPTIONS

AIRCASTLE MODEL C-300

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRCASTLE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amp.	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amp.	6BA6	6BA6	7BK	
V4	Det.-AVC-AF	6AT6	6AT6	7BT	
V5	Power Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRCASTLE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	20	350	CE-86	AF64H4A		UP2235C		TVL-3636	■ Filter
B	20	350							▲ Filter
C	20	25							Output Cathode
C2	.05	200	C207	P285-05	DF-503	PTE4S5		68P16	AVC Filter
C3	.05	200	C207	P285-05	DF-503	PTE4S5		68P16	AVC Filter
C4	.05	200	C207	P285-05	DF-503	PTE4S5		68P16	Decoupling
C5	100		CC200	SI100	D6-101	5W5T1	GP1K-101	19C11	Osc. Grid Cap.
C6	.1	400	C210	P488-1	DF-104	PTE4P1		4TM-P1	RF Bypass *
C7	.05	200	C207	P285-05	DF-503	PTE4S5		68P16	Decoupling *
C8	200		CC210	SI100	D6-201	5W5T2	GP2K-201	19C30	Diode RF Filter
C9	.01	600	C206	P485-01	D6-103	PTE6S1	821-01	68P33	Audio Coupling †
C10	200		CC210	SI200	D6-201	5W5T2	GP2K-201	19C30	AF Amp. Grid *
C11	200		CC210	SI200	D6-201	5W5T2	GP2K-201	19C30	AF Amp. Plate
C12	.01	600	C206	P485-01	D6-103	PTE6S1	821-01	68P33	Audio Coupling
C13	.5	100	C209					68P20	Hash Filter
C14	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Output Plate ‡
C15	.008	1600	C205	P1688-0075		PTE16D8		MB-D8	Buffer
C16	.5	100	C209	P185-5				68P20	Hash Filter

* Not used in all models.
† Some models use .002MFD in this application.
‡ Some models use .01MFD in this application

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	750KΩ	½	RV-300	Q13-137			Volume control
B	Sleeve Bushing		Not req.	S-5 *			Attach to R1A per instructions
C	Switch		Not req.	76-1			Attach to R1A per instructions

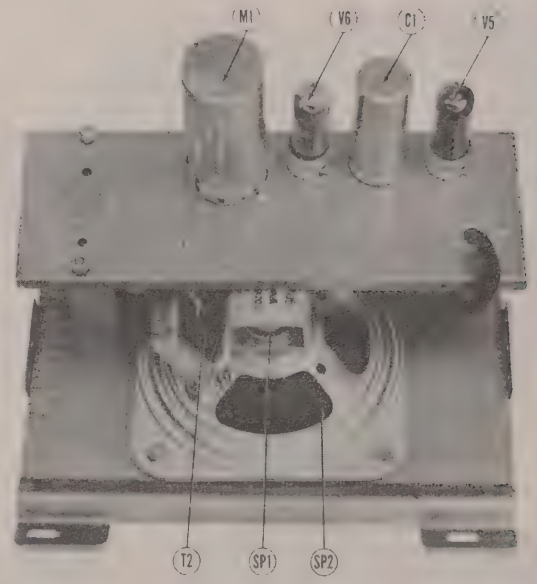
* Cut sleeve bushing to desired length to duplicate original.

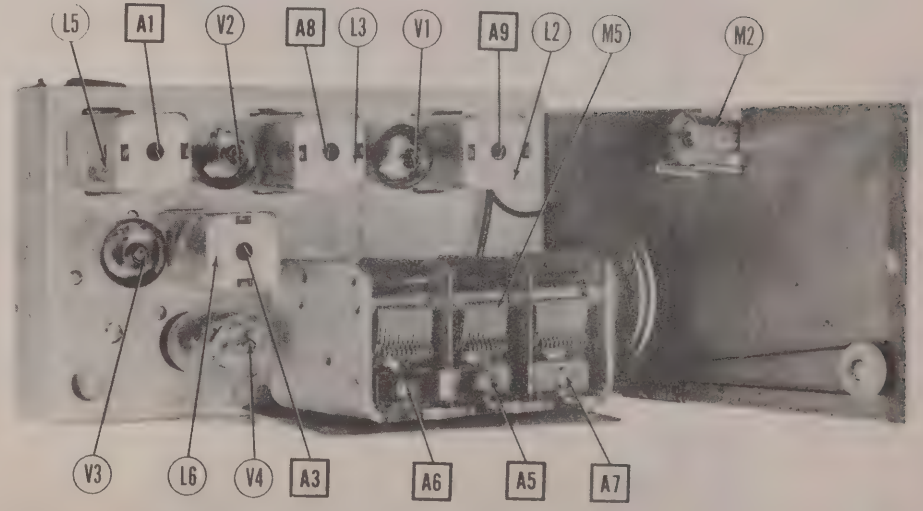
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	IDENTIFICATION CODES
R2	1Meg	½	R309	BTS-1Meg	AVC Network
R3	20KΩ	½	R306	BTS-22K	Osc. Grid
R4	820Ω	½		BTS-820	IF Amp. Cathode - See Note 1
R5	20KΩ	2	R313	BT-2-22K	Screen Dropping
R6	2Meg	½	R310	BTS-2Meg	AVC Network
R7	10Meg	½	R311	BTS-10Meg	AF Amp. Grid
R8	240KΩ	½		BTS-220K	AF Amp. Plate - See Note 2
R9	510KΩ	½	R308	BTS-470K	Output Grid
R10	330Ω	½	R303	BW-1-330	Output Cathode
R11	1000Ω	1	R312	BTA-1000	Filter
R12	100Ω	½	R301	BW-½-100	Hash Suppression
R13	100Ω	½	R301	BW-½-100	Hash Suppression
R14	1000Ω	½		BTS-1000	RF Amp. Cathode - See Note 3

Note 1 Some models use 1500Ω resistor in this application.
Note 2 Some models use a 250KΩ resistor in this application.
Note 3 Not used in all models.

CHASSIS—TOP VIEW





PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	6VDC @ 3A	425VCT .038ADC			TV-100		P-2970	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	4800Ω	3.4Ω	400Ω	.7Ω	Part of SP1	A-3877	A-2930	R0-8	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
	FIELD	V. C. IMP.	AIRCASTLE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	3.4Ω	PM-705	ST-105 ① Model P5-X	52A21 ①	① Remount output transformer
	CONE DIA.	V. C. DIA.				
SP2	5"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	AIRCASTLE PART No.	MEISSNER PART No.	
L1	Ant. Loading	2Ω		L200		Includes capacitor used as coil form
L2	Ant. Coil	14.5Ω	5Ω	57FB-3		
L3	RF Coil	90Ω	7.5Ω	57BB-4		
L4	Osc. Coil	10Ω		L201		Tap at 1.2Ω
L5	1st. IF	21Ω	21Ω	1655-16		
L6	2nd. IF	21Ω	21Ω	1655-16		
L7	Hash Choke	0Ω		L203		
L8	Hash Choke	.2Ω		L202		

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				INSTALLATION NOTES
				AIRCASTLE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	RADIART PART No.	
M1	Int.	6VDC	115∿	V-83	A-100	5301	5301	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AIRCASTLE PART No.		
M2	Bayonet	6-8	.15	Brown	T51		Type #47

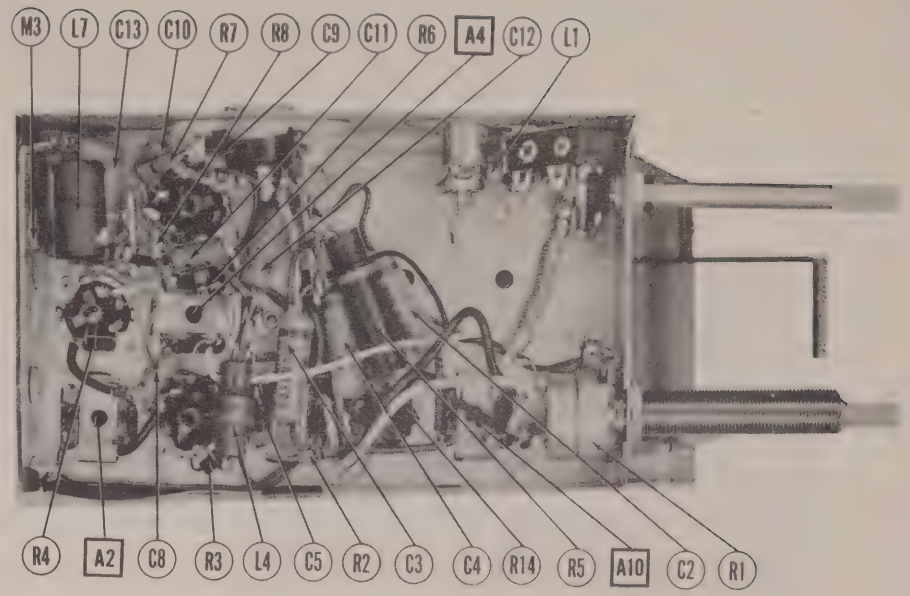
FUSES

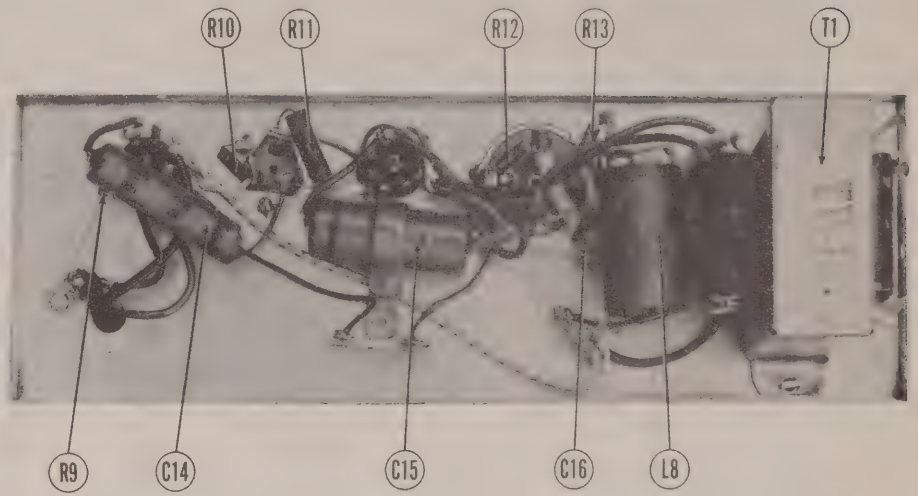
ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			AIRCASTLE PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M4	3AG	15A	A201		311015	155020A	

MISCELLANEOUS

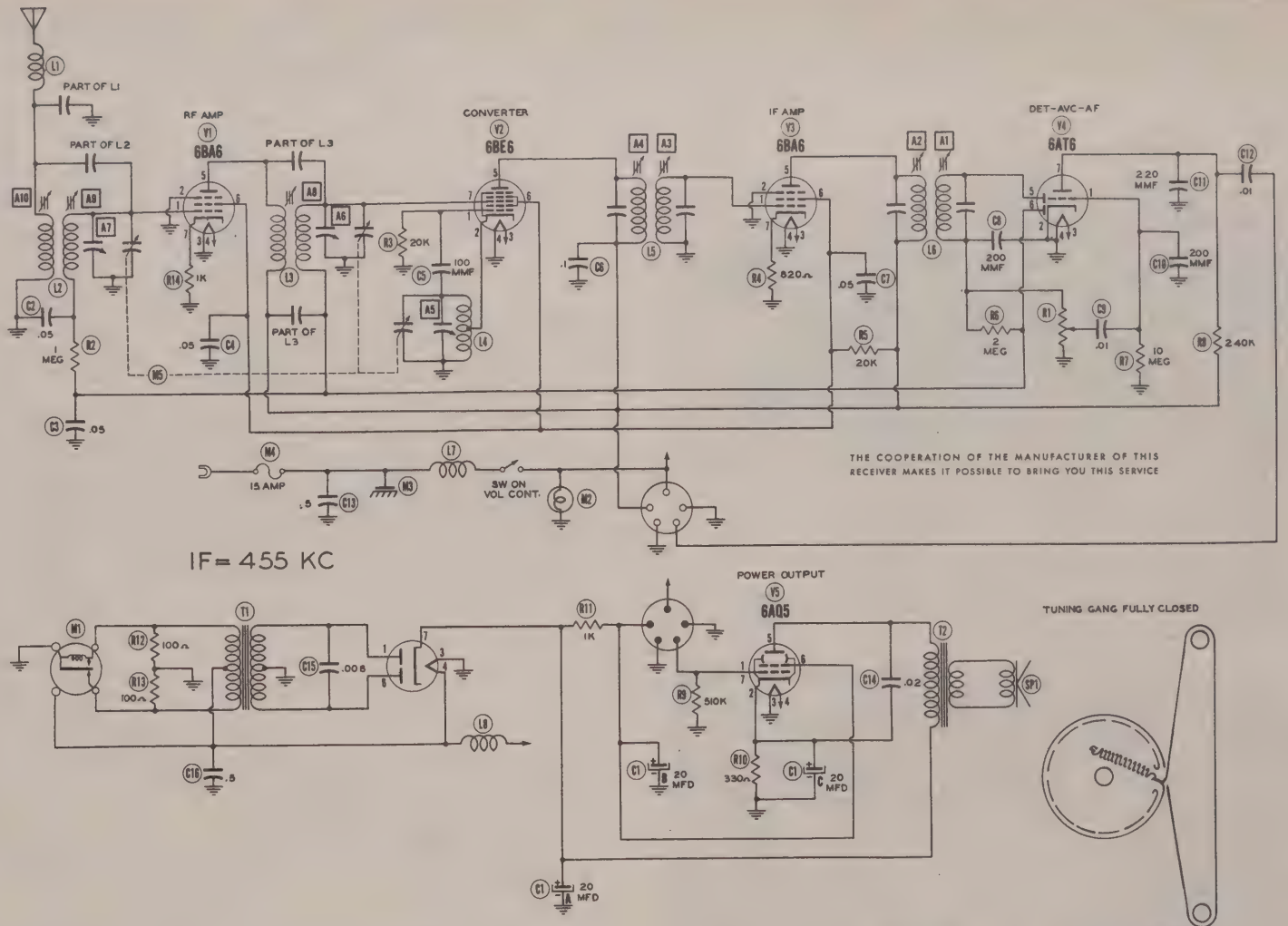
ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
M3	Spark Plate		
M5	3 Gang Var. Cap.	CV-300	(20-402MMF, 16-403MMF, 33-217MMF)
	Dial Scale	D300	
	Dial Pointer	PS300	
	Knob	H310	

CHASSIS—BOTTOM VIEW





AIRCASTLE MODEL C-300



IF= 455 KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	-.1VDC	0V	0V	6.3VDC	210VDC	70VDC	2.7VDC
V 2	6BE6	§-6.5VDC	0V	6.3VDC	0V	210VDC	70VDC	-.5VDC
V 3	6BA6	0V	0V	6.3VDC	0V	210VDC	70VDC	2.6VDC
V 4	6AT6	-.6VDC	0V	6.3VDC	0V	-.5VDC	-.5VDC	75VDC
V 5	6AQ5	0V	10VDC	0V	6.3VDC	220VDC	210VDC	0V
V 6	6X4	270VAC	0V	0V	6.3VDC	0V	270VAC	240VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	3.7Meg	0Ω	0Ω	.1Ω	†1000Ω	†21KΩ	1000Ω
V 2	6BE6	20KΩ	1.2Ω	.1Ω	0Ω	†1000Ω	†21KΩ	2.7Meg
V 3	6BA6	22Ω	0Ω	.1Ω	0Ω	†1000Ω	†21KΩ	820Ω
V 4	6AT6	10Meg	0Ω	.1Ω	0Ω	750KΩ	2.7Meg	†240KΩ
V 5	6AQ5	510KΩ	330Ω	0Ω	.1Ω	†400Ω	†1000Ω	510KΩ
V 6	6X4	380Ω	Inf.	0Ω	.1Ω	Inf.	400Ω	7KΩ

MEASURED FROM PIN 7 OF V6

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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136-3

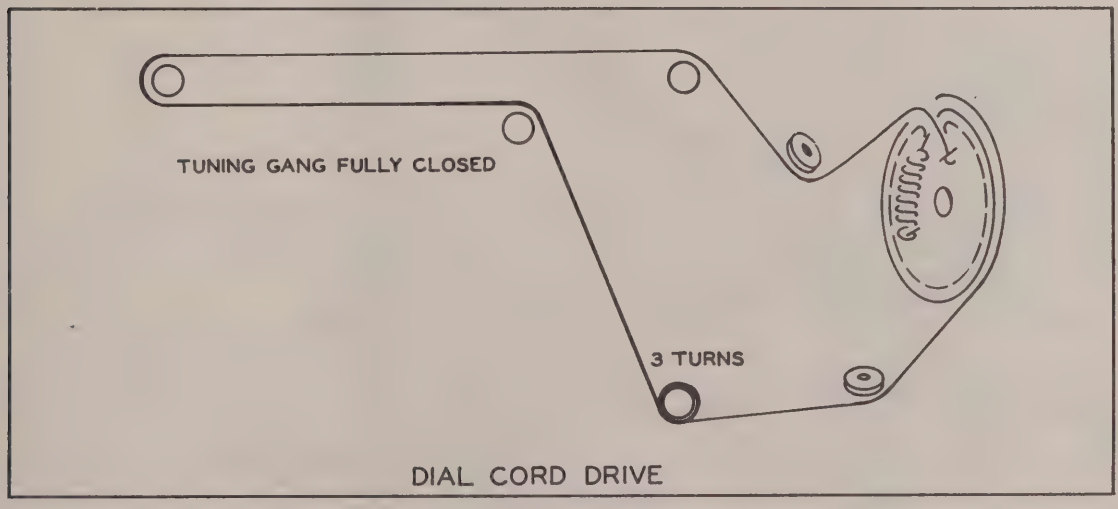
1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

AIRCASTLE
MODEL 350

AIRCASTLE MODEL 350

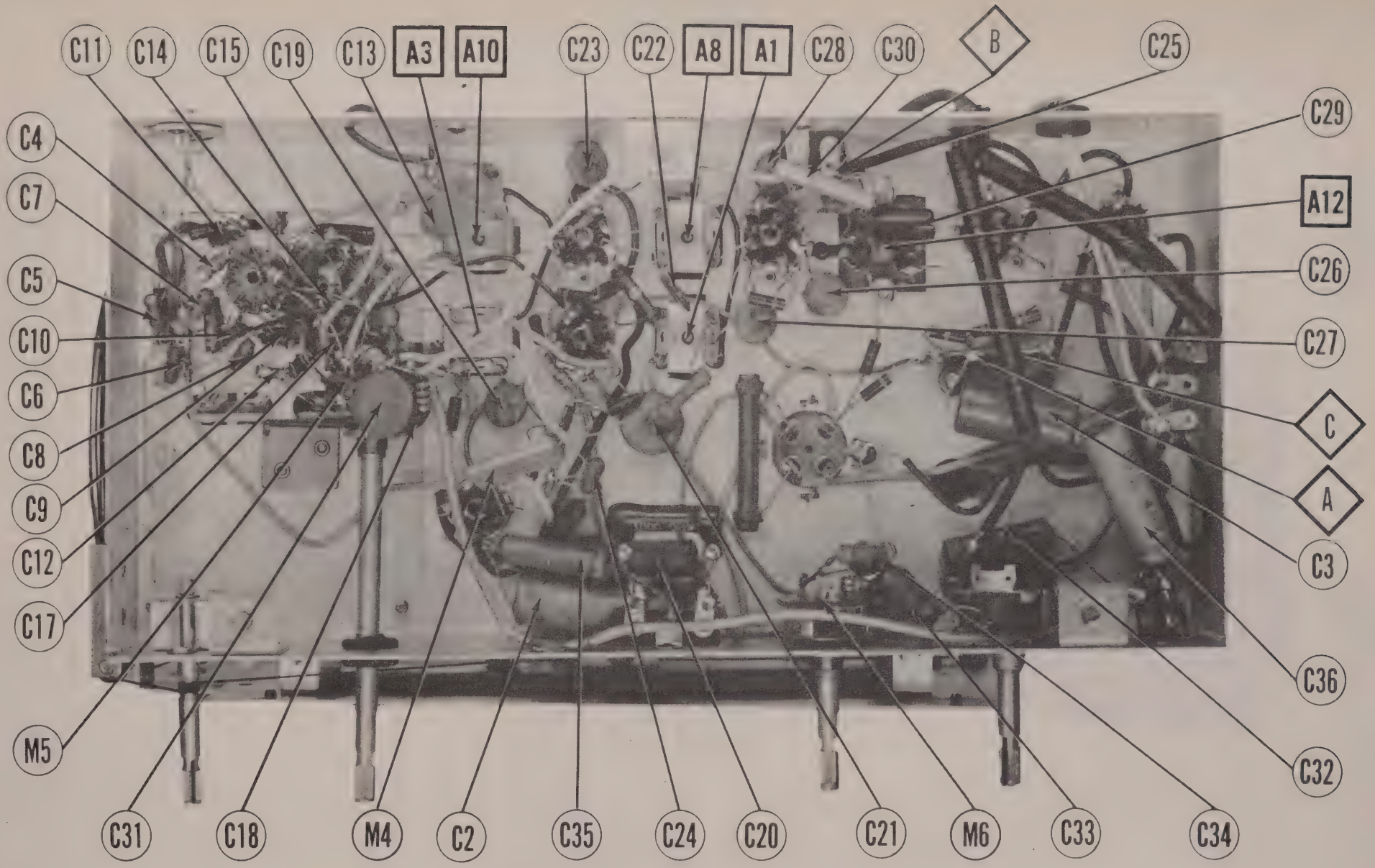
TRADE NAME	Aircastle , Model 350		
SUPPLIER	Spiegel Inc. 1061 W. 35th. St., Chicago, Illinois		
TYPE SET	AC Operated Combination Phono-Radio, AM-FM Superheterodyne Receiver		
TUBES (EIGHT)	Types 12AT7 FM RF Amp. - Mixer, 6BE6 FM Osc. -AM Conv., 6BA6 1st IF Amp., 6BA6 2nd FM IF Amp., 6AL5 Ratio Det., 6AT6 Det.-AVC-AF, 6AQ5 Power Output, 6X4 Rectifier		
POWER SUPPLY	105-125 Volts AC	RATING	.48 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC	FREQ. MOD.	88-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER SEE V-M MODEL 950 IN PHOTOFACT SET 107 FOLDER 13 OR RECORD CHANGER MANUAL CM-3



DIAL CORD DRIVE

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1951 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America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C15
C19
C13
A3
A10
C23
C22
A8
A1
C28
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B
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C29
A12
C26
C27
C
A
C3
C36
C32
C34
C33
M6
C21
C20
C24
C35
C2
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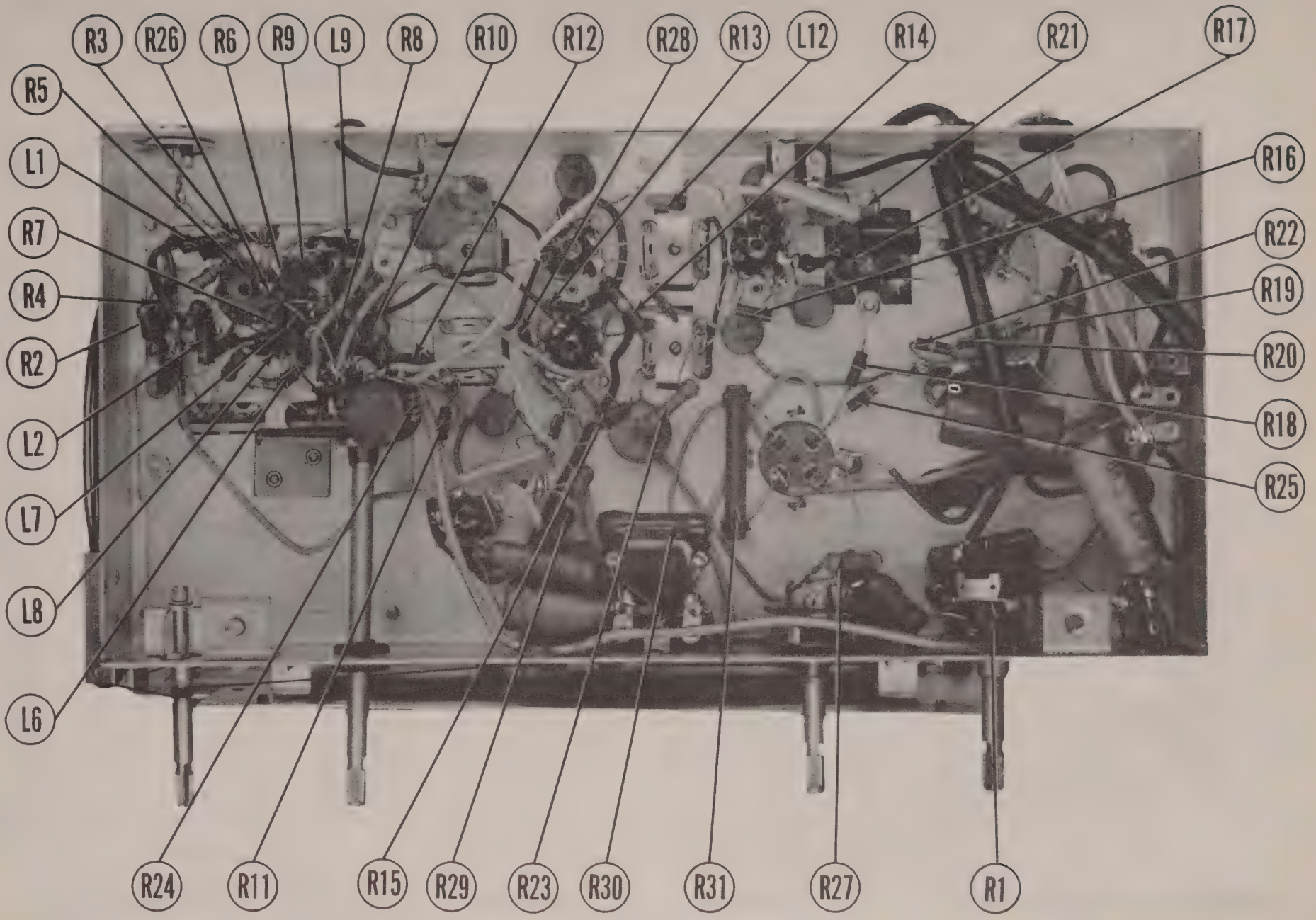
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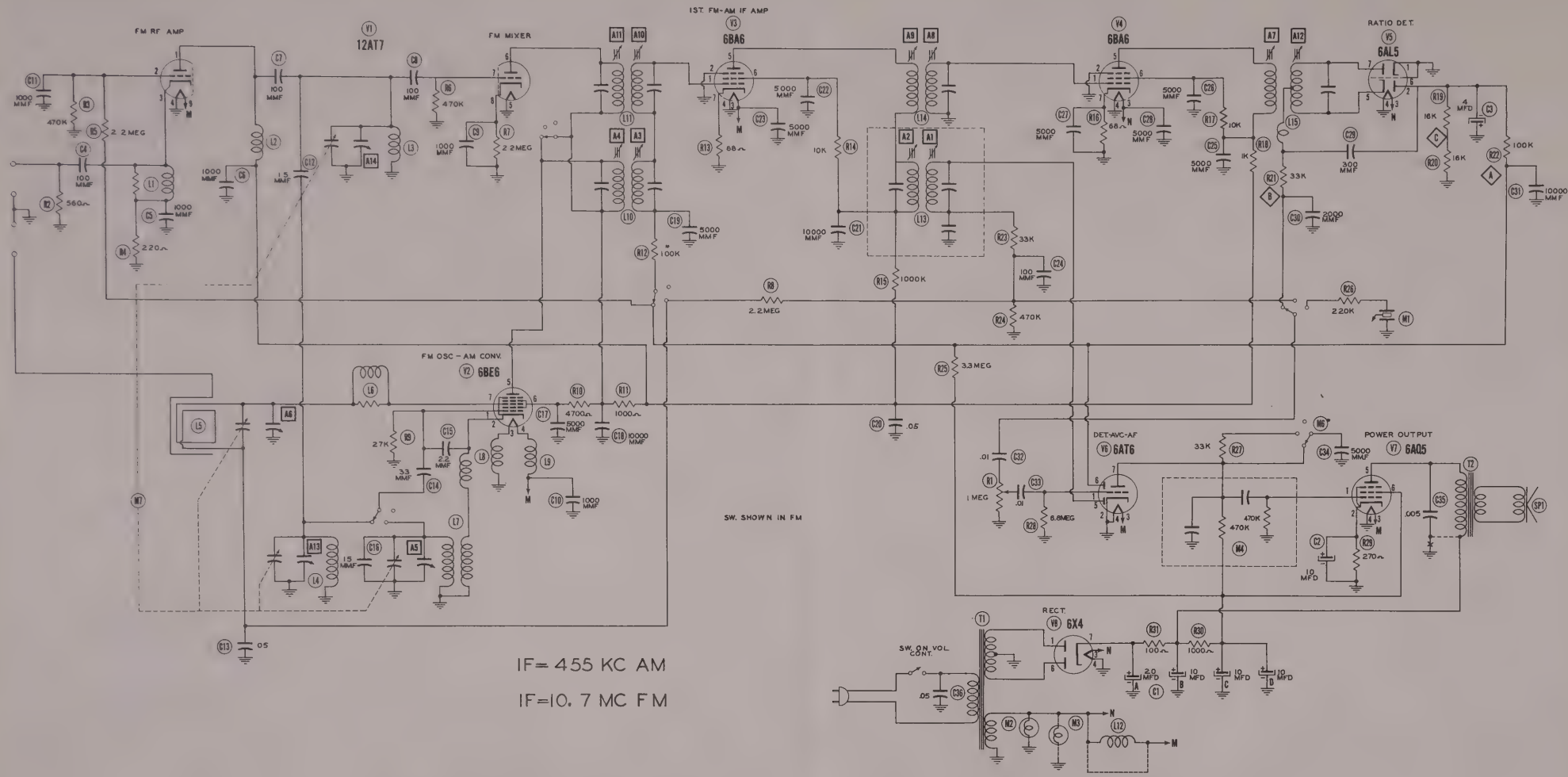
R27
R1



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AT7	160VDC	0V	1.7VDC	0V	0V	145VDC	0V	‡3.8VDC #3.3VDC	6.3VAC
V 2	6BE6	†8-4.8VDC #8-10VDC	0V	0V	6.3VAC	145VDC	90VDC	‡-1.6VDC #-.1VDC		
V 3	6BA6	-.1VDC	0V	6.3VAC	0V	145VDC	100VDC	1VDC		
V 4	6BA6	0V	0V	6.3VAC	0V	145VDC	100VDC	1VDC		
V 5	6AL5	0V	-.8VDC	6.3VAc	0V	-.2VDC	0V	-.2VDC		
V 6	6AT6	-.8VDC	0V	6.3VAC	0V	-.3VDC	‡ -.2VDC # .2VDC	55VDC		
V 7	6AQ5	0V	8VDC	6.3VAC	0V	200VDC	160VDC	0V		
V 8	6X4	215VAC	0V	6.3VAC	0V	0V	215VAC	220VDC		

§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AT7	†1.1KΩ	470KΩ	220Ω	0Ω	0Ω	†2.1KΩ	470KΩ	2.2KΩ	.1Ω
V 2	6BE6	27KΩ	1.3Ω	.3Ω	.3Ω	†2.1KΩ	†6.8KΩ	2.7Meg		
V 3	6BA6	# 200KΩ #2.7Meg	0Ω	.1Ω	0Ω	†2.1KΩ	†12KΩ	68Ω		
V 4	6BA6	.8Ω	0Ω	.1Ω	0Ω	†2.1KΩ	†12KΩ	68Ω		
V 5	6AL5	0Ω	32KΩ	.1Ω	0Ω	Inf.	0Ω	Inf.		
V 6	6AT6	6.8Meg	0Ω	.1Ω	0Ω	500KΩ	95KΩ	†470KΩ		
V 7	6AQ5	470KΩ	270Ω	.1Ω	0Ω	†380Ω	†1.1KΩ	470KΩ		
V 8	6X4	130Ω	0Ω	.1Ω	0Ω	Inf.	130Ω	40KΩ		

† TAKEN IN FM POSITION
# TAKEN IN AM POSITION
† MEASURED FROM PIN 7 OF V8

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning gang fully closed and set the pointer 1 15/16 ins. to the right of the left hand edge of the metal portion of the dial backplate.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid) of 6BE6 (V2) Low side to chassis	455KC (400∿ Mod)	AM (center)	Tuning gang fully open.	Across voice coil.	A1, A2,	Adjust for maximum output.
2.	"	"	1600KC	"	"	"	A5	"
3.		Loop	1400KC	"	Tune for max. output.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust max. output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.1MFD	High side to pin 1 (Grid) of 6BA6 (V3) Low side to chassis	10.7MC (unmod.)	FM (CW)	Tuning gang fully open.	DC probe to point Ⓐ. Common to chassis.	A7, A8, A9	Adjust for maximum deflection.
5.	"	High side to pin 7 (Grid) of 12AT7 (V1) Low side to chassis	"	"	"	"	A10, A11	"
6.	"	"	"	"	"	DC probe to point Ⓑ. Low side to point Ⓒ.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
4.	.1MFD	High side to pin 1 (Grid) of 6BA6 (V3) Low side to chassis	10.7MC (450KC SWP)	FM (CW)	Point of non-interference	Vert. amp. to point Ⓐ. Low side to chassis.	A7, A8, A9	Disconnect stabilizor capacitor C3. Adjust for maximum amplitude and symmetry as per fig. 1.
5.	"	High side to pin 7 (Grid) of 12AT7 (V1). Low side to chassis	"	"	"	"	A10, A11	"
6.	"	"	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A12	Reconnect capacitor C3. Adjust A12 so 10.7MC occurs at center of crossover lines as per fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	300Ω carbon resistor	High side thru 300Ω to ungrounded FM ant. terminal.	108.5MC (unmod.)	FM	Tuning gang fully open.	DC probe to point Ⓐ. Common to chassis.	A13	Adjust for maximum deflection.
8.	"	"	105MC	"	Tune for max. deflection.	"	A14	"

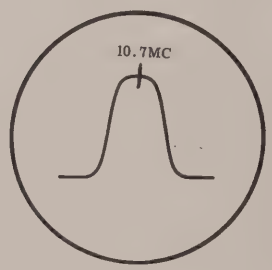


FIG. 1

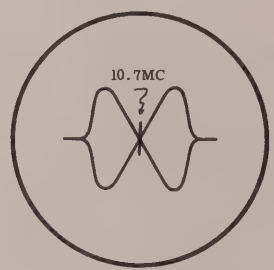


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRCASTLE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	FM RF Amp. - FM Mixer	12AT7	12AT7	9A	
V2	FM Osc. - AM Conv.	6BE6	6BE6	7CH	
V3	1st FM-AM IF Amp	6BA6	6BA6	7BK	
V4	2nd FM-IF Amp.	6BA6	6BA6	7BK	
V5	Ratio Detector	6AL5	6AL5	6BT	
V6	Det.-AVC-AF Amp.	6AT6	6AT6	7BT	
V7	Power Output	6AQ5	6AQ5	7BZ	
V8	Rectifier	6X4	6X4	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: AIRCASTLE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	20	350		AF3662J		UPT2111145		TVL-4766	● Filter
B	10	350							■ Filter
C	10	350							▲ Filter
D	10	350							Filter
C2	10	25		PRS25/10		BR102A		TVA-1204	Output Cathode
C3	4	50		PRS150/4		BR550		TVA-1303	Stabilizing Cap.
C4	100			SI100	D6-101	5W5T1	GP1K-100	19C11	Ant. Coupling
C5	1000			SI1000	D6-102	1W5D1	GP2L-001	19C1	FM RF Cathode
C6	1000			SI1000	D6-102	1W5D1	GP2L-001	19C1	RF Bypass
C7	100			SI100	D6-101	5W5T1	GP1K-100	19C11	RF Coupling
C8	100			SI100	D6-101	5W5T1	GP1K-100	19C11	RF Coupling
C9	1000			SI1000	D6-102	1W5D1	GP2L-001	19C1	FM Mixer Cathode
C10	1000			SI1000	D6-102	1W5D1	GP2L-001	19C1	FM Mixer Fil.
C11	1000			SI1000	D6-102	1W5D1	GP2L-001	19C1	AVC Filter
C12	1.5			SI1.5NP0	TCZ-1.5		NP0K-1.5		Osc. Coupling
C13	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C14	33			SI33	D6-330	5W5Q3	GP1K-33	19C24	Osc. Grid Cap.
C15	2.2				TCZ-2.2				Osc. Feedback
C16	15			SI15	TCZ-15		NP0K-15	19C5	Fixed Trimmer
C17	5000			BPD-005	DD-502	1D5D5	811-005	29C1	Osc. Anode Bypass
C18	10000			BPD-01	DD-103	PTE4S1	821-01	36C1	Conv. Decoupling
C19	5000			BPD-005	DD-502	1D5D5	811-005	29C1	AVC Filter
C20	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	RF Bypass
C21	10000			BPD-01	DD-103	PTE4S1	821-01	36C1	1st IF Dec.
C22	5000			BPD-005	DD-502	1D5D5	811-005	29C1	1st IF Screen
C23	5000			BPD-005	DD-502	1D5D5	811-005	29C1	1st IF Filament
C24	100			SI100	D6-101	5W5T1	GP1K-100	19C11	Diode RF Filter
C25	5000			BPD-005	DD-502	1D5D5	811-005	29C1	2nd IF Dec.
C26	5000			BPD-005	DD-502	1D5D5	811-005	29C1	2nd IF Screen
C27	5000			BPD-005	DD-502	1D5D5	811-005	29C1	2nd IF Cathode
C28	5000			BPD-005	DD-502	1D5D5	811-005	29C1	2nd IF Fil.
C29	300	500		1468-0003	D6-301	5W5T3	GP2K-300	1FM-335	Diode Load Cap.
C30	2000			SI2000	D6-202	1W5D2	GP2M-002	29C2	De-emphasis
C31	10000			BPD-01	DD-103	PTE4S1	821-01	36C1	AVC Filter
C32	.01	200		P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C33	.01	200		P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C34	5000			BPD-005	DD-502	1D5D5	811-005	29C1	Tone Comp.
C35	.005	600		P688-005	D6-502	PTE6D5	811-005	6TM-D5	Output Plate
C36	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Line Filter

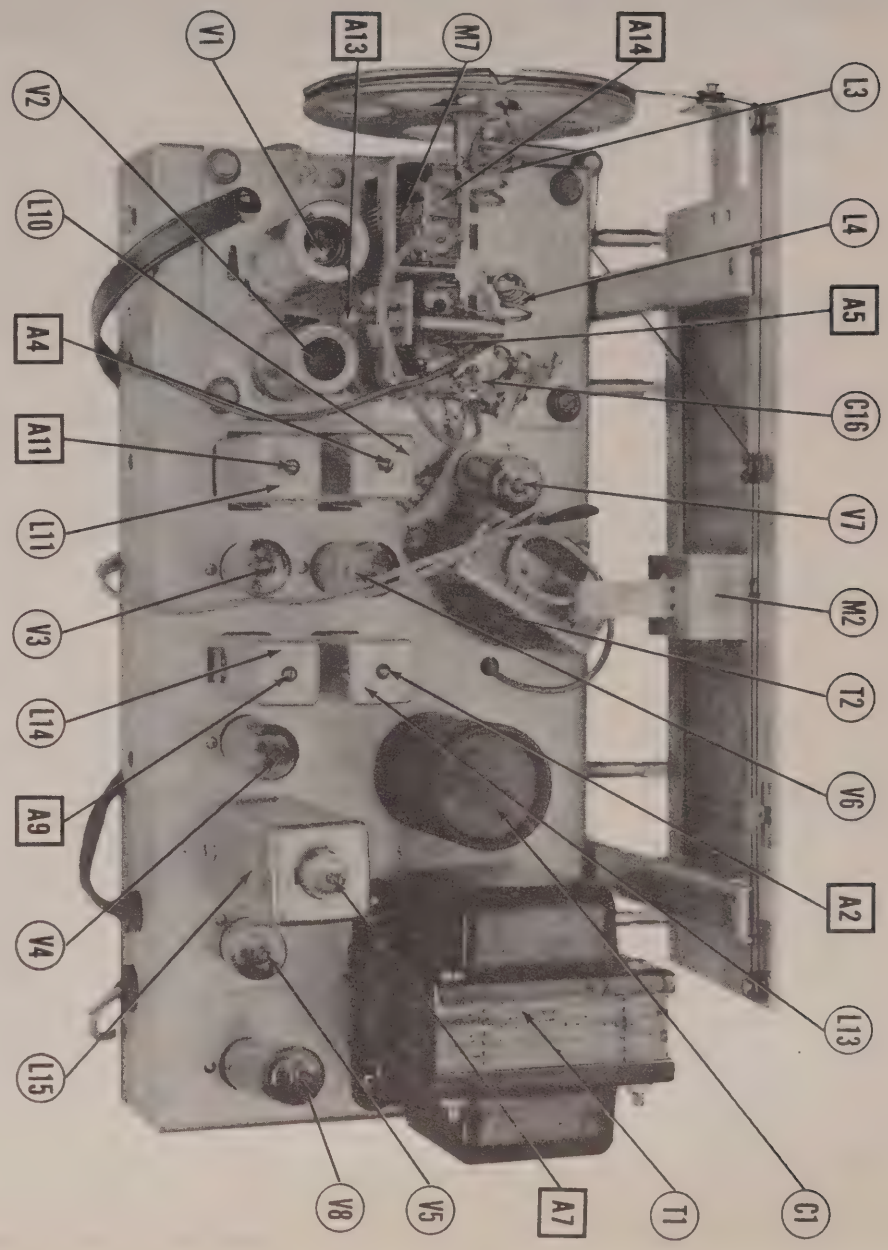
CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg	½		Q13-137	AM-63-Z	BSK-70-S	Volume Control - See Note 1
B	* Shaft			Not Req	KSS-3	Not Req	Attach to R1A per instructions
C	Switch			76-1	SW-A	Not Req	Attach to R1A per instructions

Note 1 Some models may use 500KΩ Control

SET 136 FOLDER 4

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	AIRCASTLE PART No.	IRC PART No.	
R2	560Ω	½		BTS-560	Antenna Loading
R3	470KΩ	½			FM RF Amp. Grid
R4	220Ω	½		BTS-220	FM RF Amp. Cathode
R5	2.2Meg	½		BTS-2.2Meg	AVC Network
					FM Mixer Grid
R6	470KΩ	½			
R7	2200	½		BTS-2200	FM Mixer Cathode
R8	2.2Meg	½		BTS-2.2Meg	AVC Network
R9	27K	½		BTS-27K	FM Osc. Grid - See Note 2
R10	4700	½		BTS-4700	FM Osc. Anode
R11	1000Ω	½		BTS-1000	Decoupling
R12	100KΩ	½		BTS-100K	AVC Network
R13	68Ω	½			1st IF Amp. Cathode
R14	10KΩ	½			1st IF Amp. Screen
R15	1000Ω	½		BTS-1000	1st IF Amp. Decoupling
R16	68Ω	½			2nd FM IF Amp. Cathode
R17	10KΩ	½			2nd FM IF Amp. Screen
R18	1000Ω	½		BTS-1000	2nd FM IF Amp. Decoupling
R19	16KΩ	½			Ratio Det. Diode Load - See Note 3
R20	16KΩ	½			Ratio Det. Diode Load - See Note 3
R21	33KΩ	½		BTS-33K	De-emphasis - See Note 2
R22	100KΩ	½		BTs-100K	AVC Network
R23	33KΩ	½		BTS-33K	Diode Filter - See Note 4
R24	470KΩ	½		BTS-470K	Diode Load
R25	3.3Meg	½		BTS-3.3Meg	AVC Network
R26	220KΩ	½		BTS-220K	Series Phono
R27	33KΩ	½		BTS-33K	Tone Compensation - See Note 4
R28	6.8Meg	½		BTS-6.8Meg	AF Amp. Grid
R29	270Ω	1		BTA-270	Output Cathode
R30	1000Ω	5		13/4A-1000	Filter - Wire Wound
R31	100Ω	1		BTA-100	Filter

Note 2 Some models use 22KΩ Resistor in this application
Note 3 Some models use 12KΩ Resistor in this application
Note 4 Some models use 47KΩ Resistor in this application

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC	450 VCT	6.3VAC			PC-8420 ① ②		
	② .48A	.085ADC	② 3.15A					

① Drill new mounting hole
② Add series resistor to reduce plate voltage

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	5.1KΩ	3.2Ω	480Ω	.8Ω		A-3877 ①	A-3026 ①	R0-9 ①	① Drill one new mounting hole

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AIRCASTLE PART No.	VIKING PART No.	QUAM PART No.	
SP1	FIELD	V. C. IMP.		10J12	10A4A	
	PM	3.2Ω				
	CONE DIA.	V. C. DIA.				
SP2	9 3/8"	1"				

PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	AIRCASTLE PART No.	MEISSNER PART No.	
L1	Cathode Choke	.1Ω				Wound on 1KΩ Resistor
L2	RF Choke	.5Ω				
L3	FM RF Coil	0Ω				
L4	FM Osc. Coil	0Ω				
L5	Loop Ant.	.1Ω	1.3Ω			
L6	Ant. Loading Coil	0Ω				Wound on 47Ω Resistor
L7	AM Osc. Coil	1.3Ω	5.5Ω			
L8	Fil. Choke	.3Ω				
L9	Fil. Choke	.3Ω				
L10	1st AM IF	35Ω	16Ω			
L11	1st FM IF	.8Ω	.8Ω			
L12	Fil. Choke	0Ω				
L13	2nd AM IF	13Ω	13Ω			
L14	2nd FM IF	.8Ω	.8Ω			
L15	Ratio Det. Trans.	1.1Ω	.1Ω			

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA								REMARKS
	AIRCASTLE PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		ACD-J	A-1 A-3	W22AB	A65MG A62A	96	0-3 S-1	

ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

DIAL LIGHTS

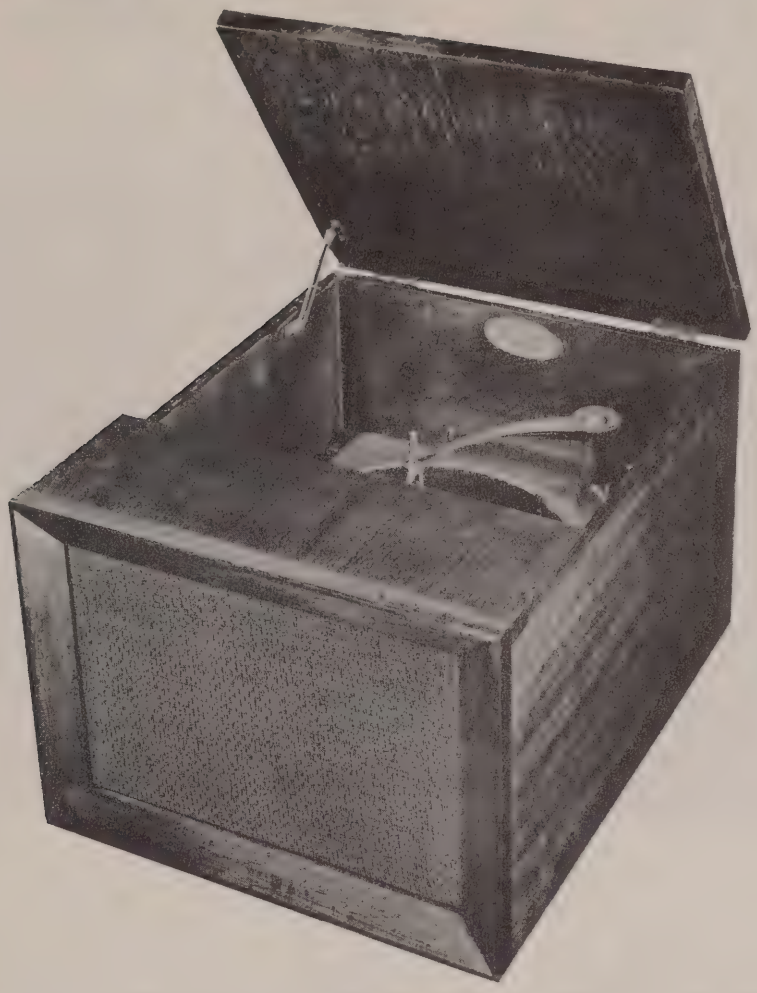
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AIRCASTLE PART No.		
M2	Bayonet	6-8	.15	Brown			Type #47
M3	Bayonet	6-8	.15	Brown			Type #47 †

† Not used in all models

MISCELLANEOUS

ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
M4	Audio Coupling Unit		
M5	Switch		Function (Phono-AM-FM)
M6	Switch		Tone
M7	2 Gang Var. Cap.		(16-527MMF, 21-202MMF)

ARTHUR ANSLEY
MODELS LP-6, LP-6-S



TRADE NAME	Arthur Ansley, Models LP-6, LP-6-S
MANUFACTURER	Arthur Ansley Mfg. Co., Doylestown, Pennsylvania
TYPE SET	AC Operated Phono Player with 3 Tube Amplifier
TUBES (THREE)	Types 6C4 AF Amplifier, 6V6GT Power Output, 6X4GT Rectifier
POWER SUPPLY	110-120 Volts AC RATING .35 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER SEE WEBSTER-CHICAGO MODEL 100 IN PHOTOFACT SET 135 FOLDER 14.

ARTHUR ANSLEY
MODELS LP-6, LP-6-S

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		ARTHUR ANSLEY PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier	6C4	6C4	6BG	
V2	Power Output	6V6GT	6V6GT	7AC	
V3	Rectifier	6X4GT	6X4GT	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	ARTHUR ANSLEY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	20	450		AF44J		UP2245		TVL-2755	▲ Filter
B	20	450							■ Filter
C2	4	450		PRS450/4		BR445		TVA-1402	Output Screen
C3	25	25		PRS25/25		BR252A		TVA-1205	Output Cathode
C4	.01	400		P488-01	D6-103	PTE4S1	GP2-333-01	4TM-S1	Audio Coupling
C5	.01	400		P488-01	D6-103	PTE4S1	GP2-333-01	4TM-S1	Audio Coupling
C6	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Tone Comp.
C7	.0068	400		P688-0068	D6-682	PTE6D6	GP2-333-682	6TM-D68	Line Filter
C8	10000			BPD-01	DD-103	PTE6S1	821-01	36C1	Output Plate *

* Not used in all models.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESIST-ANCE	WATTS	Arthur Ansley PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½		Q13-133	AM-60-Z	B-60	Volume Control
B	Shaft			Not req.	RS-2	Not req.	Attach to R2A per instructions
C	Switch			76-1	SW-A	Not req.	Attach to R2A per instructions
R2	100KΩ	½		Q11-128	AM-29-S	B-40	Tone Control
	Shaft			Not req.	RS-2	Not req.	Attach to R3A per instructions

RESISTORS

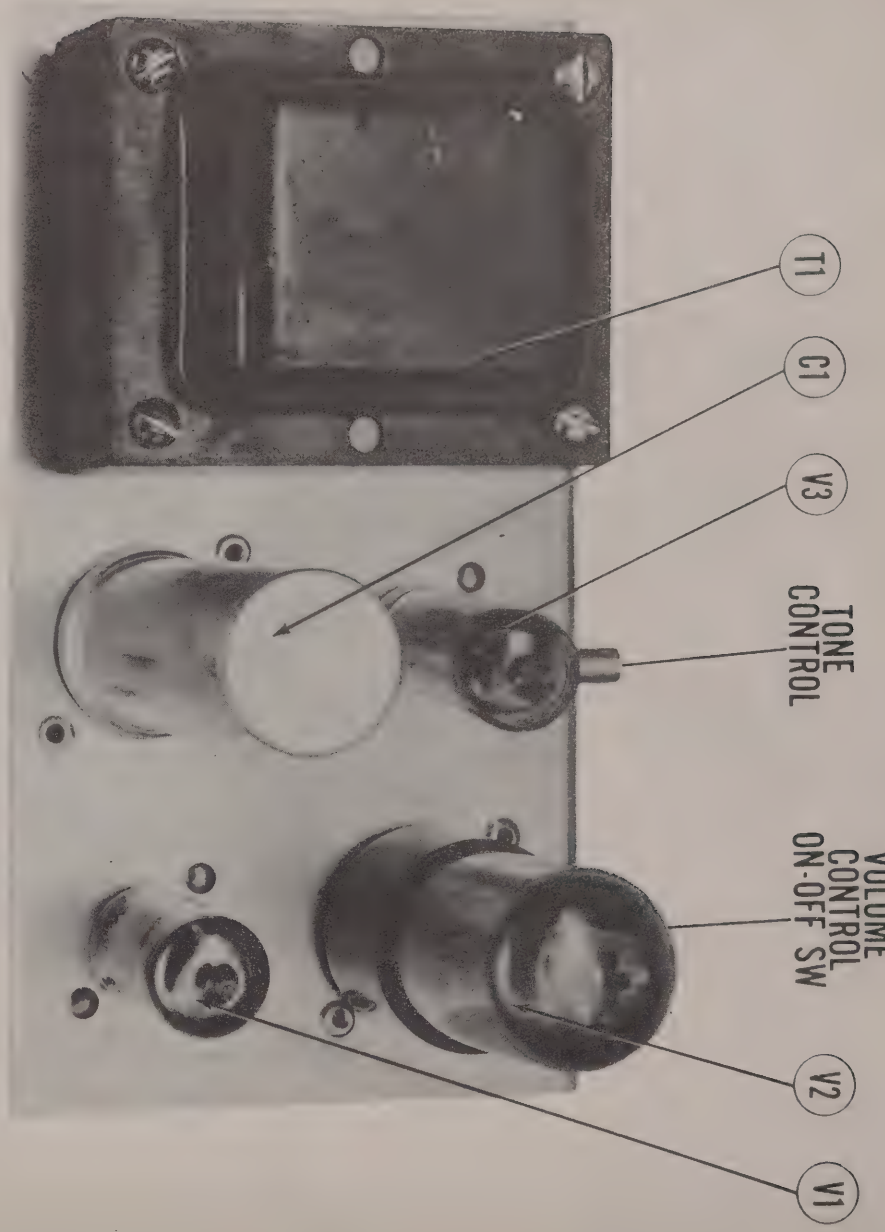
ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	Arthur Ansley PART No.	IRC PART No.	
R3	10Meg	½		BTS-10Meg	AF Amp. Grid
R4	510KΩ	½		BTS-470K	AF Amp. Plate
R5	240KΩ	½		BTS-220K	Output Grid
R6	360Ω	4			Output Cathode - Wire Wound
R7	4700Ω	1		BTA-4700	Output Screen
R8	650Ω	7			Filter - Wire Wound
R9	240KΩ	½		BTS-220K	Volume Control Shunt - Note 1

Note 1 Used only in Model LP-6-S.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	ARTHUR ANSLEY PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ②.35A	600VCT .050ADC	6.3V ②1.2A			P-6119		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		Arthur Ansley PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	4.2KΩ	3.2Ω	290Ω	.5Ω		A-3849	A-3019	R0-9 ①	① Drill one new mounting hole.

SPEAKER

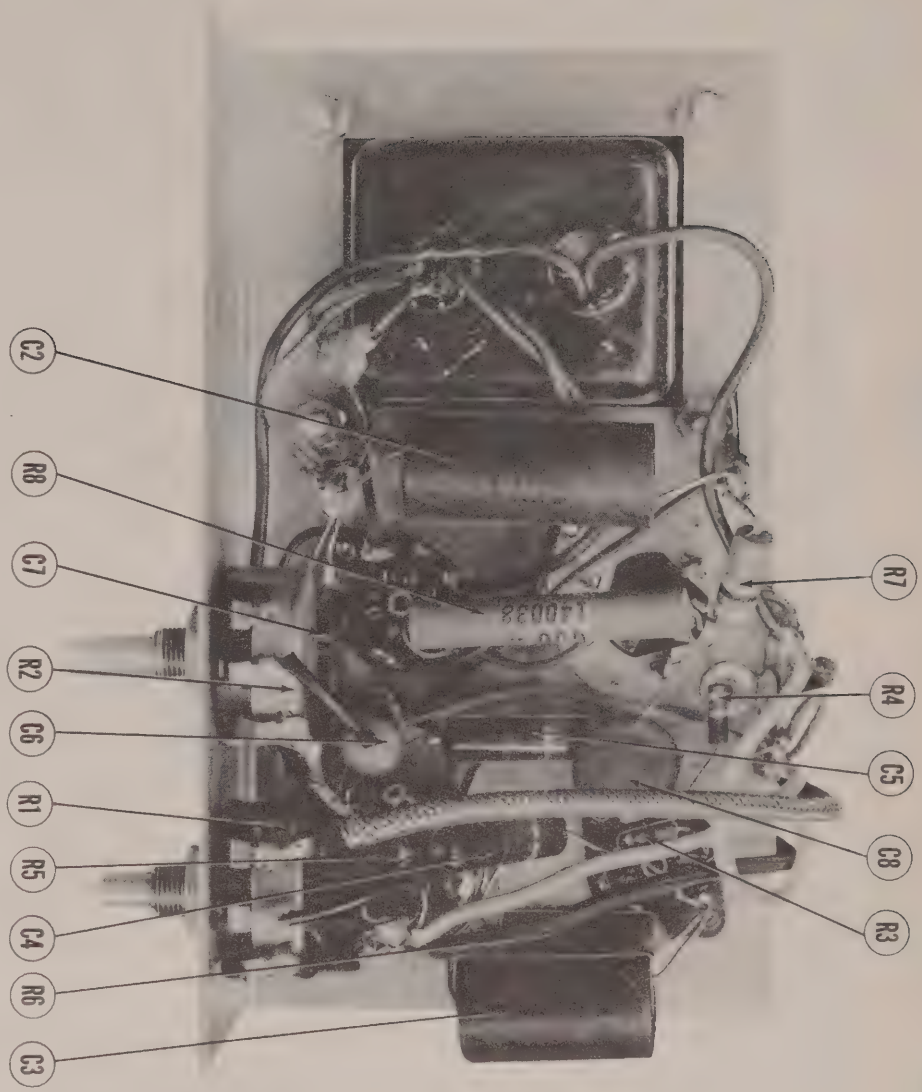
ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
	FIELD	V. C. IMP.	Arthur Ansley PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	3.2Ω		10J12	10A4A	
	CONE DIA.	V. C. DIA.				
SP2	9⅝"	1"				

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA							REMARKS
	Arthur Ansley PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		ACD-J	A-1 A-3	W22AB	A62A A65MG	96	0-3 or S-3 and 0-1 or S-1	

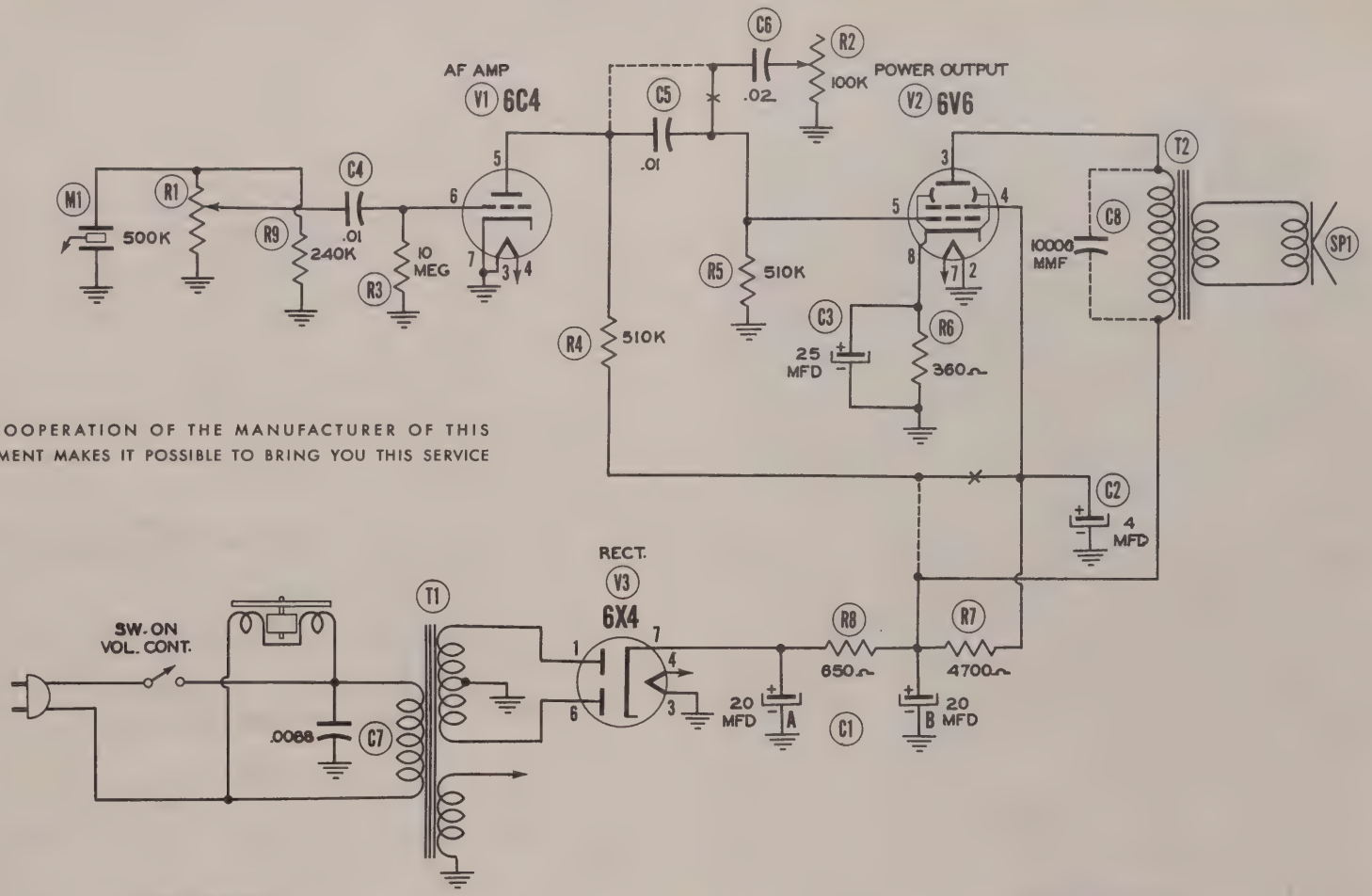
ASTATIC, SHURE, AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

CHASSIS—BOTTOM VIEW



ARTHUR ANSLEY MODEL LP-6

ARTHUR ANSLEY MODEL LP-6



THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6C4	18VDC	0V	0V	6.3VAC	18VDC	-.6VDC	0V	
V 2	6V6GT	0V	0V	250VDC	230VDC	0V	0V	6.3VAC	30VDC
V 3	6X4GT	310VAC	0V	0V	6.3VAC	0V	310VAC	300VDC	

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6C4	†600K	Inf.	0Ω	.2Ω	†600KΩ	10Meg	0Ω	
V 2	6V6GT	Inf.	0Ω	†1000Ω	†5.6KΩ	240KΩ	Inf.	.2Ω	380Ω
V 3	6X4GT	320Ω	Inf.	0Ω	.2Ω	Inf.	320Ω	500KΩ	

† MEASURED FROM PIN 7 OF V3

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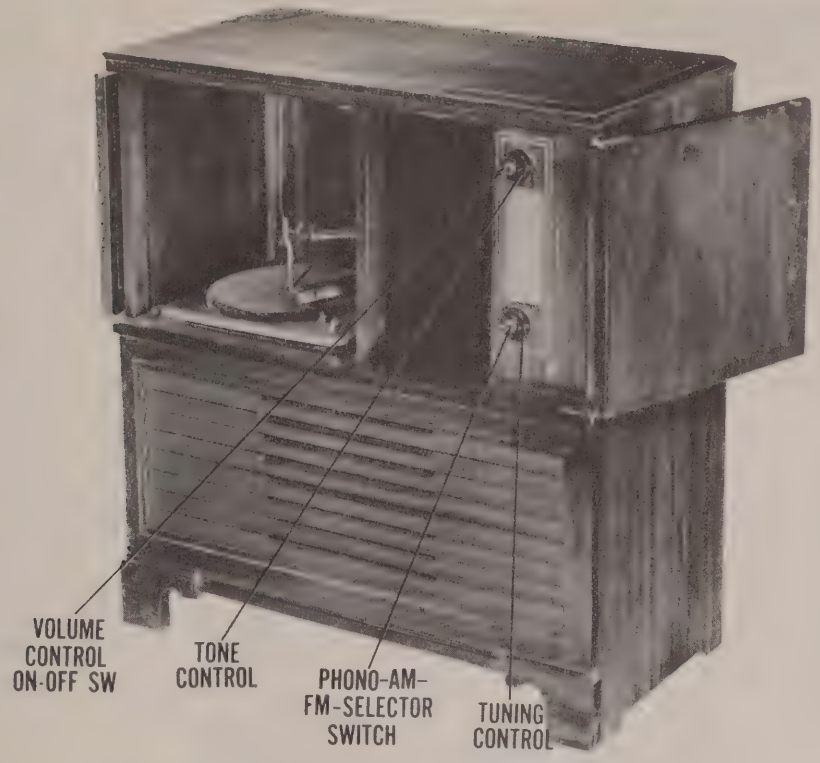
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

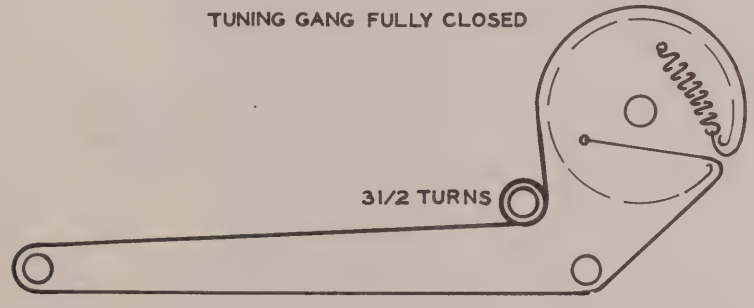
BENDIX
MODELS 951, 951W



BENDIX
MODELS 951, 951W

TRADE NAME	Bendix, Model 951, 951W	
MANUFACTURER	Bendix Radio, Div. of Bendix Aviation Corp., Baltimore, Maryland	
TYPE SET	AC Operated Compination Phono-Radio, AM-FM Superheterodyne Receiver	
TUBES (SEVEN)	Types 12AT7 FM RF-Mixer, 6BE6 AM Conv.-FM Osc., 6BA6 1st. IF Amp., 6AU6 2nd. FM IF Amp., 6T8 or 6V8 DET.-AVC-AF, 6V6GT or 6K6GT Power Output, 5X3GT Rectifier	
POWER SUPPLY	110-120 Volts AC	RATING .50 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1620KC	FREQ. MOD. 88-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER SEE WEBSTER-CHICAGO MODEL 100 IN PHOTOFACT SET 135 FOLDER 14.



DIAL CORD DRIVE

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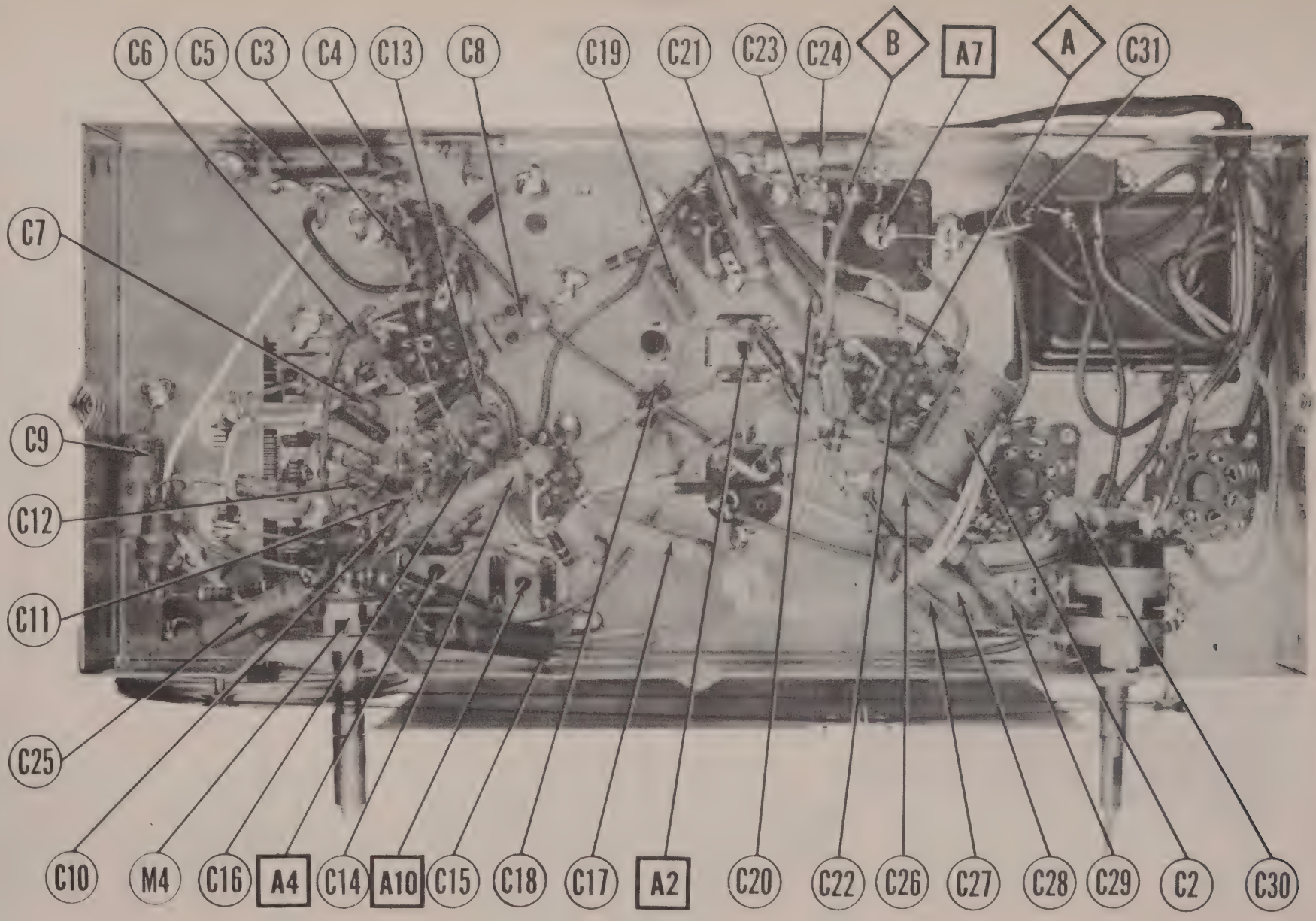
C6
C5
C3
C4
C13
C8
C19
C21
C23
C24
B
A7
A
C31
C7
C9
C12
C11
C25
C10
M4
C16
A4
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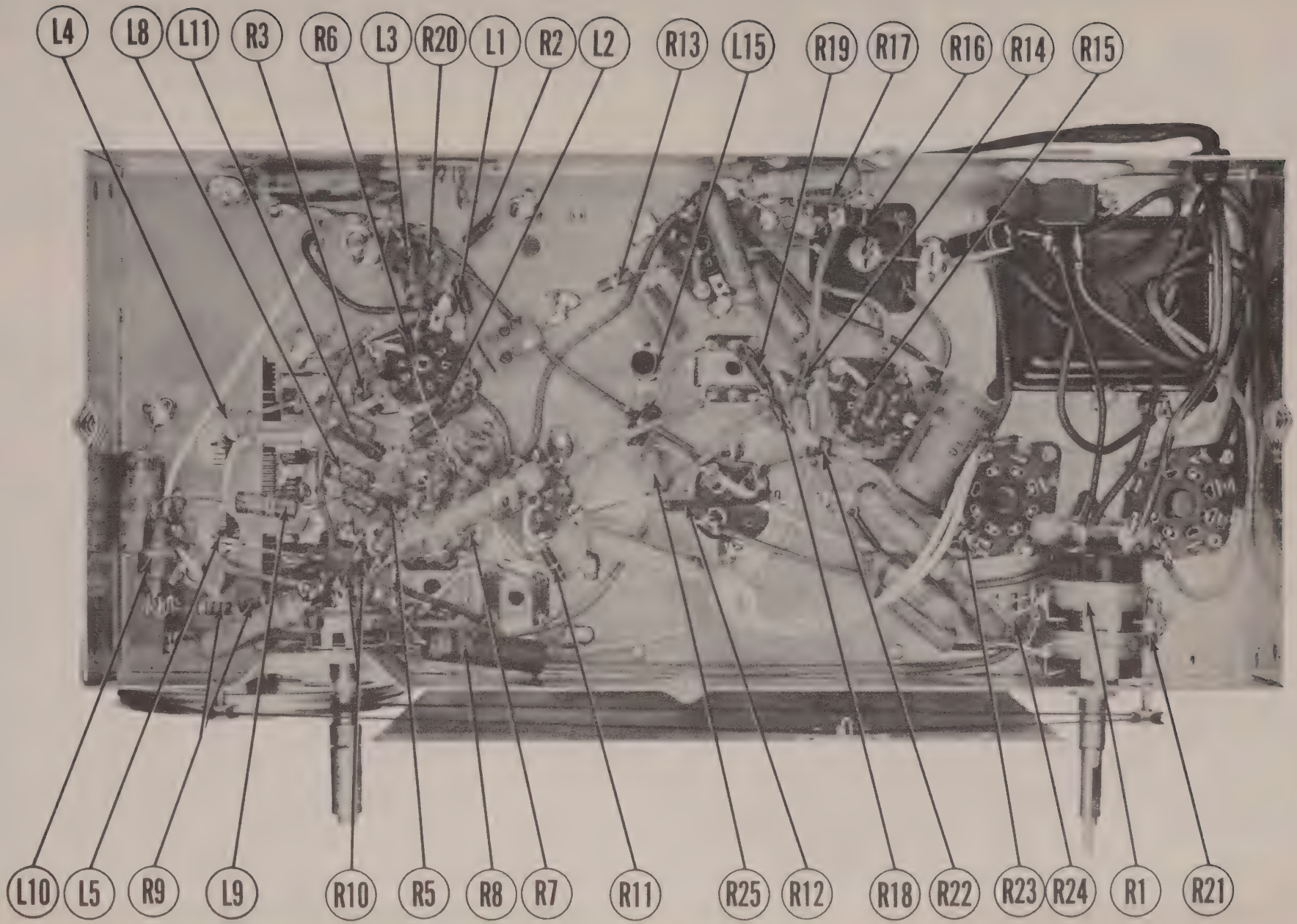
C28
C29
C2
C30


L4
L8
L11
R3
R6
L3
R20
L1
R2
L2
R13
L15
R19
R17
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R14
R15
L10
L5
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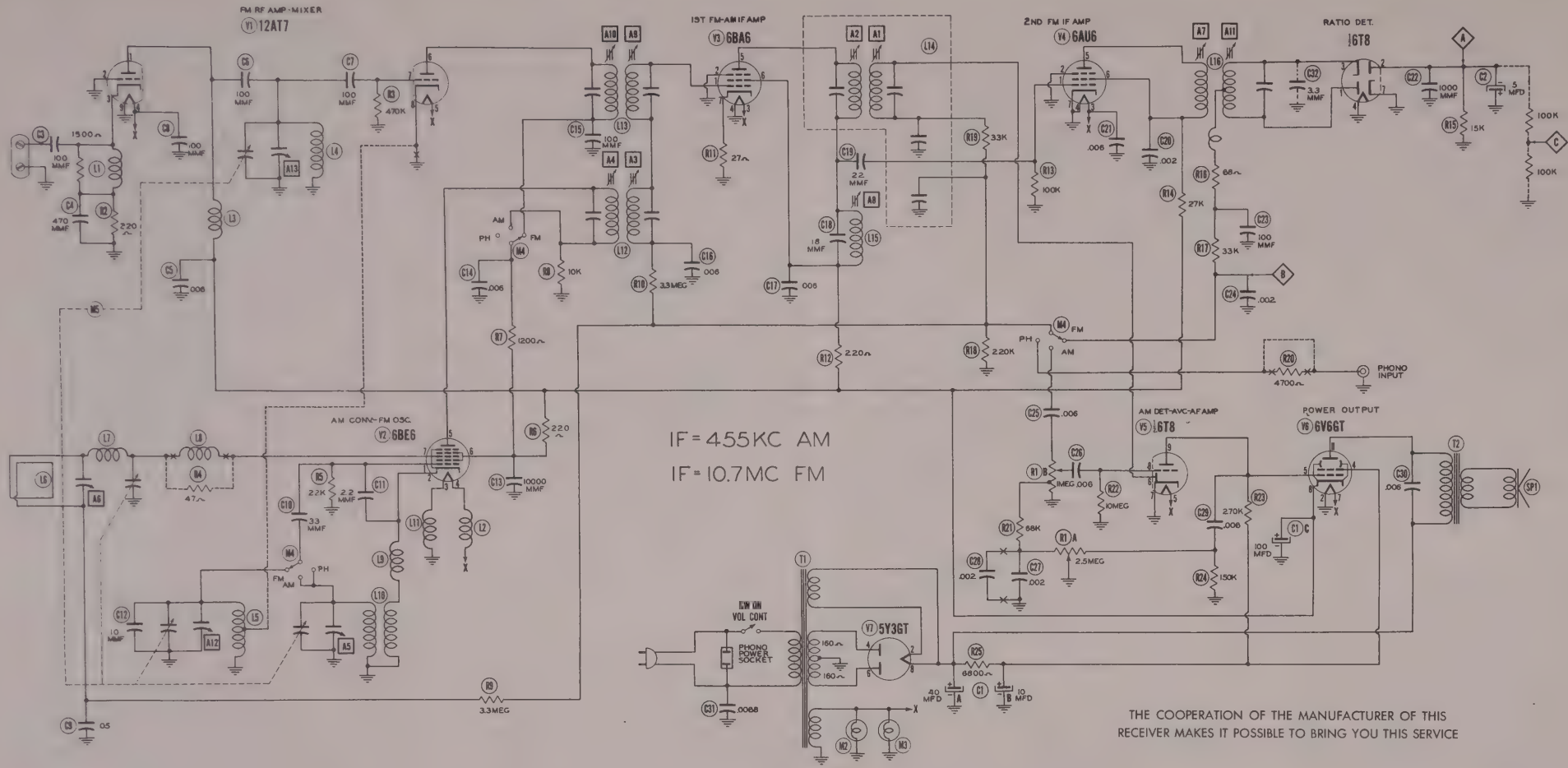
R23
R24
R1
R21



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

† TAKEN IN FM POSITION
▲ TAKEN IN AM POSITION

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AT7	105VDC	0V	1VDC	6.3VAC	6.3VAC	▲0V †100VDC	-1.2VDC	0V	0V
V 2	6BE6	▲-4.3VDC †-1.2VDC	0V	0V	6.3VAC	▲85VDC †0V	100VDC	▲-.2VDC †-1VDC		
V 3	6BA6	-.3VDC	0V	6.3VAC	0V	100VDC	100VDC	.4VDC		
V 4	6AU6	-.6VDC	0V	6.3VAC	0V	45VDC	45VDC	0V		
V 5	½T8	-.3VDC	-.6VDC	-.3VDC	0V	6.3VAC	▲-.6VDC	0V	-.8VDC	90VDC
V 6	6V6GT	0V	0V	320VDC	315VDC	90VDC	0V	6.3VAC	105VDC	
V 7	5Y3GT	0V	340VDC	0V	300VAC	0V	300VAC	0V	340VDC	

‡ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AT7	†3Ω	0Ω	220Ω	.2Ω	.2Ω	††1.2KΩ	470KΩ	0Ω	0Ω
V 2	6BE6	22KΩ	2.3Ω	.1Ω	.2Ω	▲†1.2KΩ	†220Ω	3.5Meg		
V 3	6BA6	3.5Meg	0Ω	.1Ω	0Ω	†220Ω	†220Ω	27Ω		
V 4	6AU6	100KΩ	0Ω	.1Ω	0Ω	†27KΩ	†27KΩ	0Ω		
V 5	½T8	Inf.	15KΩ	Inf.	0Ω	.1Ω	250KΩ	0Ω	10Meg	#275KΩ
V 6	6V6GT	Inf.	0Ω	#570Ω	#6.8KΩ	#275KΩ	Inf.	.1Ω	12KΩ	
V 7	5Y3GT	Inf.	60KΩ	Inf.	180Ω	Inf.	180Ω	Inf.	60KΩ	

† MEASURED FROM PIN 8 OF V6
# MEASURED FROM PIN 8 OF V7

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning gang fully closed and set pointer 1½ ins. to the right of the lower left edge of the dial backplate.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator on rear "AM" section of tuning gang. Low side to chassis.	455KC (400∿ Mod.)	AM (Center)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1620KC	"	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	"	Tune for max. output.	"	A6	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (± 1%) resistors in series from Point (A) to chassis. The junction of these two resistors is alignment Point (C) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 1 (Grid) of 6BA6 (V3). Low side to chassis.	10.7MC (unmod.)	FM (CW)	Tuning gang fully open.	DC probe to point (A). Common to chassis.	A7, A8	Adjust for maximum deflection.
5.	"	High side to pin 7 (Grid) of 6BE6 (V2). Low side to chassis.	"	"	"	"	A9, A10	"
6.	"	"	"	"	"	DC probe to point (B). Common to point C.	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
4.	.01MFD	High side to pin 1 (Grid) of 6BA6 (V3) Low side to chassis	10.7MC (450KC SWP)	FM (CW)	Point of non-interference.	Vert. Amp. to point (A). Low side to chassis.	A7, A8	Disconnect stabilizor capacitor C2. Adjust for maximum amplitude and symmetry as per fig. 1.
5.	"	High side to pin 7 (Grid) of 6BE6 (V2) Low side to chassis	"	"	"	"	A9, A10	"
6.	"	"	"	"	"	Vert. Amp. to point (B). Low side to chassis.	A11	Reconnect capacitor C2. Adjust A11 so 10.7MC occurs at center of crossover lines as per fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	300Ω Carbon Resistor	High side thru 300Ω to ungrounded FM ant. terminal. Low side to chassis	108.5MC (unmod.)	FM	Tuning gang fully open.	DC probe to point (A). Common to chassis.	A12, A13	Adjust for maximum deflection.
8.	"	"	87.5MC	"	Tuning gang fully closed.	"	L6, L4	Check coils with a tuning wand and if necessary expand or compress coil turns for maximum deflection. If coils are changed repeat steps 7 & 8 until no further improvement can be made.

FIG. 1

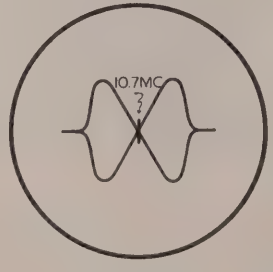


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: BENDIX PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	FM RF Amplifier - FM Mixer	12AT7	12AT7	9A	
V2	AM Converter-FM Oscillator	6BE6	6BE6	7CH	
V3	1st. FM-AM IF Amp	6BA6	6BA6	7BK	
V4	2nd. FM IF Amp.	6AU6	6AU6	7BK	
V5A	Ratio Detector-AM Det.-AVC-AF	6T8	6T8	9E	
B	Ratio Detector-AM Det.-AVC-AF	6V8	6V8		
V6A	Power Output	6V6GT	6V6GT	7AC	
B	Power Output	6K6GT	6K6GT	7S	
V7	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: BENDIX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	CE3A06	AFH82J16E		UPT4145-820		TVL-3762	▲ Filter
B	10	450							■ Filter
C	100	200							▲ Filter
C2	5	50	CE1T06	PRS150/4		BR550		TVA-1303	Stabilizing Cap.
C3	100	500	CM22A101M	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	RF Coupling
C4	470		CC9M42	SI470	D6-471	5W5T5	GP2K-471	19C15	FM RF Amp. Cathode
C5	.006	600	CP6T20	P688-006	D6-562	PTE6D6	GP2-333-602	6TM-D6	RF Bypass
C6	100		CC9A34	SI100	D6-101	5W5T1	GP1K-101	19C11	RF Coupling
C7	100		CC9A34	SI100	D6-101	5W5T1	GP1K-101	19C11	RF Coupling
C8	100	500	CM22A101M	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	FM RF Amp. Fil.
C9	.05	200	CP2T40	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C10	33		CC8B28	SI33	D6-330	5W5Q4	GP1K-330	19C24	Osc. Grid Cap.
C11	2.2		CC9A14		TCZ-2.2				Osc. Feedback
C12	10		CC6B22				N330K-10		Fixed Trimmer *
C13	10000		CC9R80	BPD-01	DD-103	PTE4S1	821-01	36C1	Osc. Anode Bypass
C14	.006	600	CP6T20	P688-006	D6-562	PTE6D6	GP2-333-602	6TM-D6	Conv. Decoupling
C15	100		CC9A34	SI100	D6-101	5W5T1	GP1K-101	19C11	Conv. Decoupling
C16	.006	600	CP6T20	P688-006	D6-562	PTE6D6	GP2-333-602	6TM-D6	AVC Filter
C17	.006	600	CP6T20	P688-006	D6-562	PTE6D6	GP2-333-602	6TM-D6	1st. IF Dec.
C18	18	500	CM6S16		TCZ-18		NP0K-18		Fixed Trimmer
C18	22	500	CM22A220M	1468-000025	D6-220	5W5Q25	GP1K-22	19C23	IF Coupling
C20	.002	600		P688-002	D6-202	PTE6D2	GP2-333-203	6TM-D2	2nd. IF Dec. †
C21	.006	600	CP6T20	P688-006	D6-562	PTE6D6	GP2-333-602	6TM-D6	2nd. IF Fil.
C22	1000		CC9M50	SI1000	D6-102	1W5D1	GP2L-102	19C1	RF Bypass
C23	100	500	CM22A101M	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Diode Load Cap. †
C24	.002	600	CP6T12	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	De-emphasis
C25	.006	600	CP6T20	P688-006	D6-562	PTE6D6	GP2-333-602	6TM-D6	Audio Coupling
C26	.006	600	CP6T20	P688-006	D6-562	PTE6D6	GP2-333-602	6TM-D6	Audio Coupling
C27	.002	400	CP6T12	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Tone Comp.
C28	.002	400	CP6T12	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Tone Comp. §
C29	.006	600	CP6T20	P688-006	D6-562	PTE6D6	GP2-333-602	6TM-D6	Tone Comp.
C30	.006	600	CP6T20	P688-006	D6-562	PTE6D6	GP2-333-602	6TM-D6	Output Plate
C31	.0068	600	CP9T21	P688-0068	D6-682	PTE6D6	GP2-333-682	6TM-D68	Line Filter
C32	3.3		CC9A16	SI3.3NP0	TCZ-3.3		NP0K-3.3		Balancing §

* Some models use 8.2MMF in this application.
† Some models use .006MFD in this application.
‡ Some models use 220MMF in this application.
§ Not used in all models.

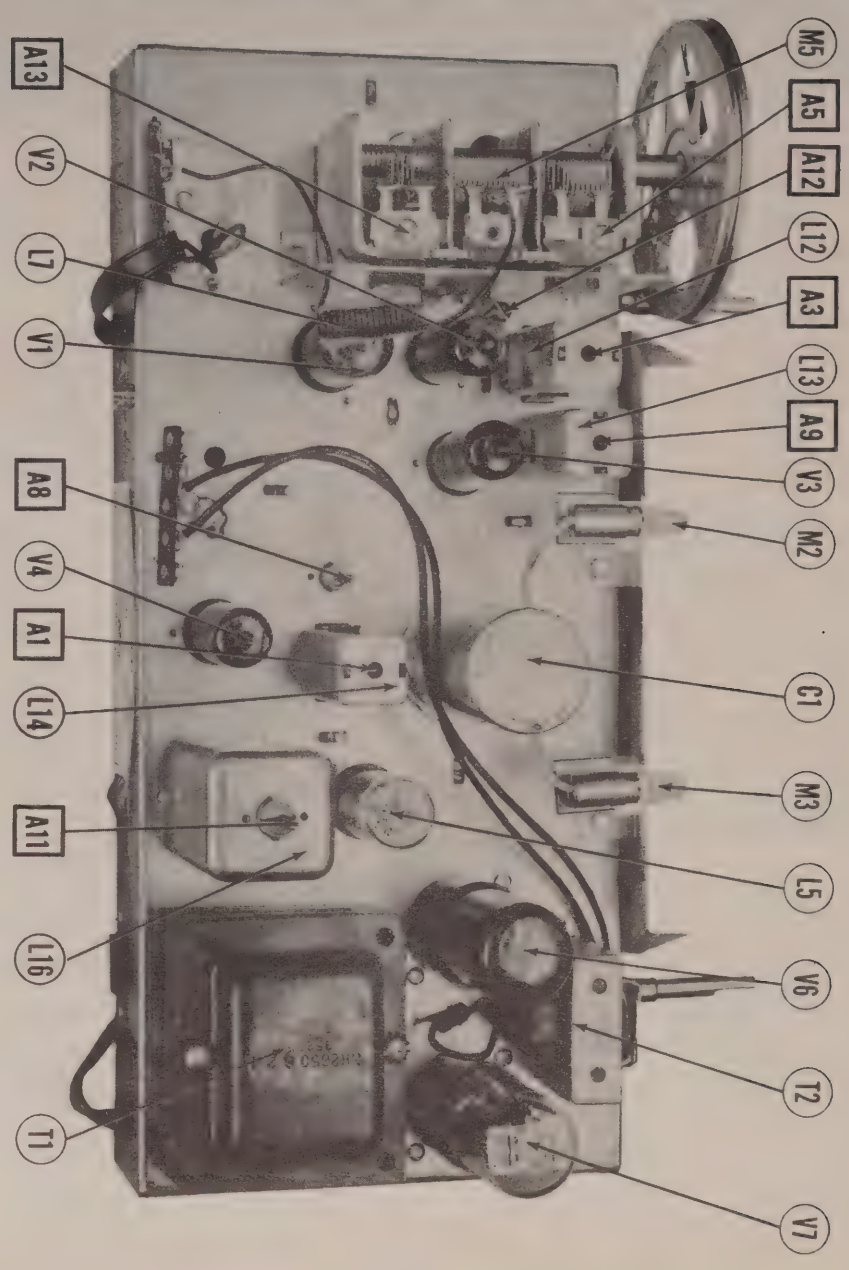
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: BENDIX PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2.5Meg	1/2		Concentrikit B11-139 ø	RTV-194		Tone control - Front Volume control - Tapped @ 300KΩ - Rear Attach per instructions in "Concentrikit"
B	1Meg	1/2	▲	B19-137X ø			
C	Shaft end			E-187 ø			
D	Switch			76-1 ø			

ø Additional parts to be used with "Concentrikit"
▲ Some models 4 Meg tone control and 2 Meg volume control Part # RV4D00

SET 136 FOLDER 6

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	BENDIX PART No.	IRC PART No.	
R2	220Ω	½	RC22A221M	BTS-220	FM RF Amp. Cathode
R3	470K	½	RC22A474M	BTS-470K	FM Mixer Grid
R4	47Ω	½	RC22A470M		Parasitic Suppressor - See Note 1
R5	22KΩ	½	RC22A223M	BTS-22K	AM Osc. Grid
R6	220Ω	½	RC22A221M	BTS-220	Decoupling
R7	1200Ω	½	RC22A122M	BTS-1200	Decoupling - See Note 2
R8	10KΩ	2	RC25A103M	BTB-10K	Voltage Divider
R9	3.3Meg	½	RC22A335M	BTS-3.3Meg	AVC Network
R10	3.3Meg	½	RC22A335M	BTS-3.3Meg	AVC Network
R11	27Ω	½	RC22A270K		1st. IF Amp. Cathode
R12	220Ω	½	RC22A221M	BTS-220	1st. IF Amp. Decoupling
R13	100KΩ	½	RC22A104M	BTS-100K	2nd. FM IF Amp. Grid
R14	27KΩ	½	RC22A273K	BTS-27K	2nd. FM IF Amp. Decoupling
R15	15KΩ	½	RC22A153M	BTS-15K	Ratio Det. Diode Load
R16	68Ω	½	RC22A680M		Balancing
R17	33KΩ	½	RC22A333M	BTS-33K	De-emphasis
R18	220KΩ	½	RC22A224M	BTS-220K	Diode Load
R19	33KΩ	½	RC22A333M	BTS-33K	Diode Filter
R20	4700Ω	½	RC22A472M	BTS-4700	Series Phono
R21	68KΩ	½	RC22A683M	BTS-68K	Tone Compensation - See Note 3
R22	10Meg	½	RC22A106M	BTS-10Meg	AF Amp. Grid
R23	270KΩ	½	RC22A274K	BTS-270K	AF Amp. Plate
R24	150KΩ	½	RC22A154M	BTS-150K	Tone Compnesation
R25	6800Ω	1	RC24A682M	BTA-6800	Filter

Note 1 Some models use 2.2Microhenries choke in this application.
Note 2 Some models use 1000Ω Resistor in this application.
Note 3 Some models use 100KΩ Resistor in this application.
Note 4 Some models use Series Resistors in this application to obtain desired value.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	BENDIX PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ .47A	600VCT .040ADC	5VAC @ 2A	6.3VAC @ 2.6A	TP0H03	PM8407	P-2951	PH-70 ③

③ Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		BENDIX PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	7KΩ	3.5Ω	570Ω	.5Ω	TA0025	A-3878 ①	A-3020 ①	R0-13 ①	① Drill new mounting holes.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
	FIELD	V. C. IMP.	BENDIX PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	3.5Ω	SPIR03 ②	10J12	10A4A	
B	PM	3.5Ω		12J12	12A4A	
	CONE DIA.	V. C. DIA.				
SP2A	9½	1"				
B	11 3/4	1"				

② Used in some models.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	BENDIX PART No.	MEISSNER PART No.	IRC PART No.	
L1	FM Ant. Coil	0Ω		LA0F02			Wound on 1.5KΩ Resistor
L2	Fil. Choke	.1Ω		LF0A00			
L3	RF Choke	3Ω		LF0A12		CLA	3.3Microhenries
L4	FM RF Coil	0Ω		LI0F02			
L5	FM Osc. Coil	0Ω		L07F01			
L6	Loop Ant.	1.3Ω		AL0Z23			
L7	AM Ant. Loading Coil	0Ω		LF0A11			
L8	Parasitic Suppressor	1.8Ω		LF0A13		CLA	2.2Microhenries
L9	RF Choke	1.8Ω		LF0A13		CLA	2.2Microhenries Some models use 47Ω Resistor
L10	AM Osc. Coil	.5Ω	6.4Ω	T00B00			
L11	Fil. Choke	.1Ω		LF0A00			
L12	1st. AM IF	16Ω	16Ω	TI0C14			
L13	1st. FM IF	.6Ω	.6Ω	TI0C15			
L14	2nd. AM IF	8.5Ω	8.5Ω	TI0D27			
L15	2nd. FM IF	.2Ω		LI0F03			
L16	Ratio Det. Trans.	1.4Ω	.1Ω	TR0R00			

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA								REMARKS
	BENDIX PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		AC-AG-J	A-AG	W26B	A66U	33	0-2 or S-2	

ASTATIC, SHURE, AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					BENDIX PART No.		
M2	Bayonet	6-8	.25	Blue			Type # TS44
M3	Bayonet	6-8	.25	Blue			Type # TS44

MISCELLANEOUS

ITEM No.	PART NAME	BENDIX PART No.	NOTES
M4	Switch	SR3D00	Function
M5	2 Gang Var. Cap.	CV0F00	(15-494MMF, 22-220MMF)
A12	Trimmer	CT1B06	FM Osc. Adj.
	Dial Scale	DS0C18	
	Cabinet	ZW7G12	
	Knob	KC0B31	Tone
	Knob	KC0B32	Volume
	Knob	KC0B33	Tuning
	Knob	KC0B34	Switch

PHOTOFACT* Folder

DEWALD MODELS DT-162R, DT-163A, R, DT-190D, ET-140R, ET-141R, ET-170, ET-171, ET-172, ET-190D, R

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Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL ET-170

DEWALD MODELS DT-162R, DT-163A, R, DT-190D, ET-140R, ET-141R, ET-170, ET-171, ET-172, ET-190D, R

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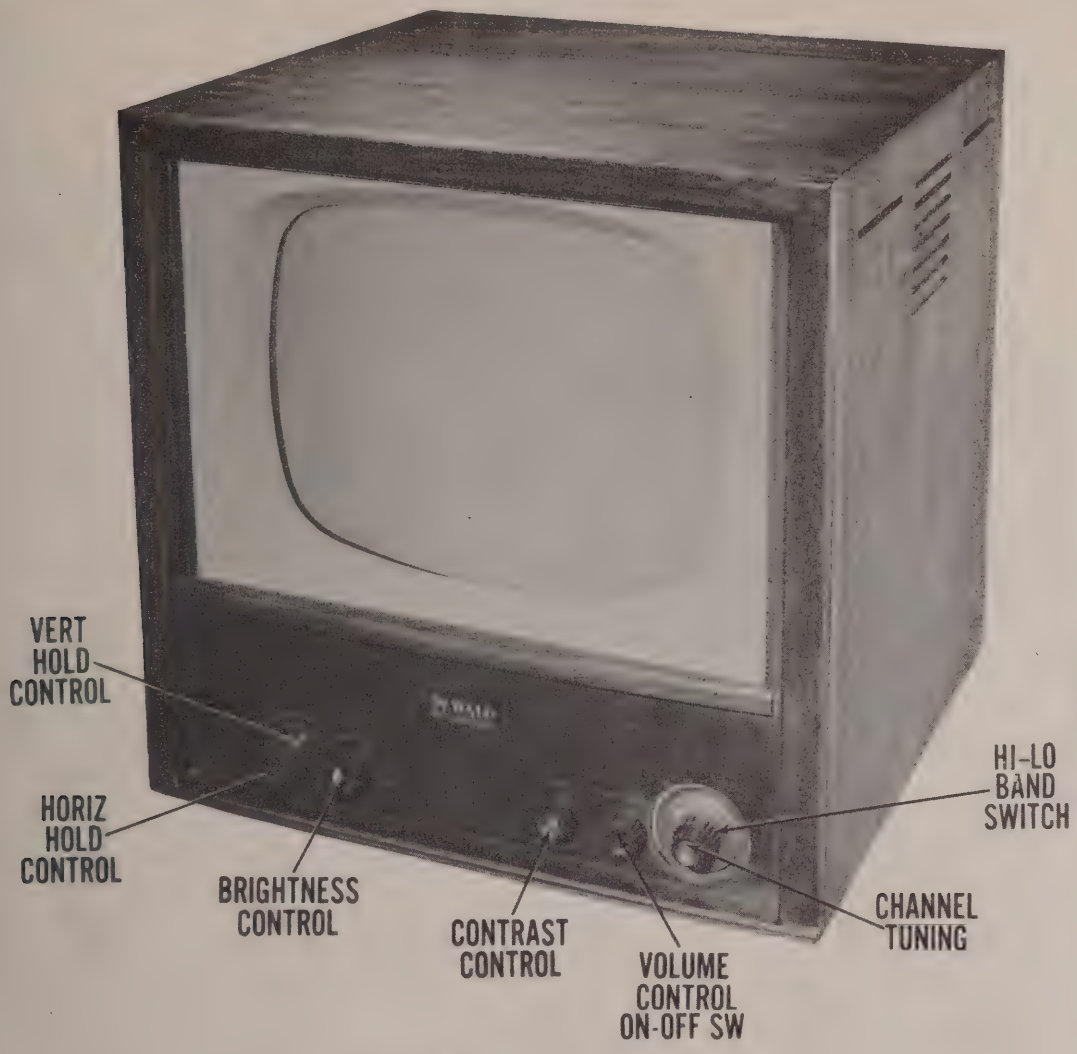
DATE 6-51 SET 136 FOLDER 7

PHOTOFACT* Folder
*TRADE MARK

DEWALD MODELS DT-162R, DT-163A, R, DT-190D, ET-140R, ET-141R, ET-170, ET-171, ET-172, ET-190D, R



DEWALD MODEL ET-170

TRADE NAME	Dewald, Models DT-162R, DT-163A, R, DT-190D, ET-140R, ET-141R, ET-170, ET-171, ET-172, ET-190D, R
MANUFACTURER	Dewald Radio Mfg. Co., 35-15 37 Ave., Long Island City, N.Y.
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC - 60 Cycle — RATING 1.7 Amp. @ 117 Volts AC
TUNING RANGE-	Channels 2 thru 13

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DATE 6-51 SET 136 FOLDER 7

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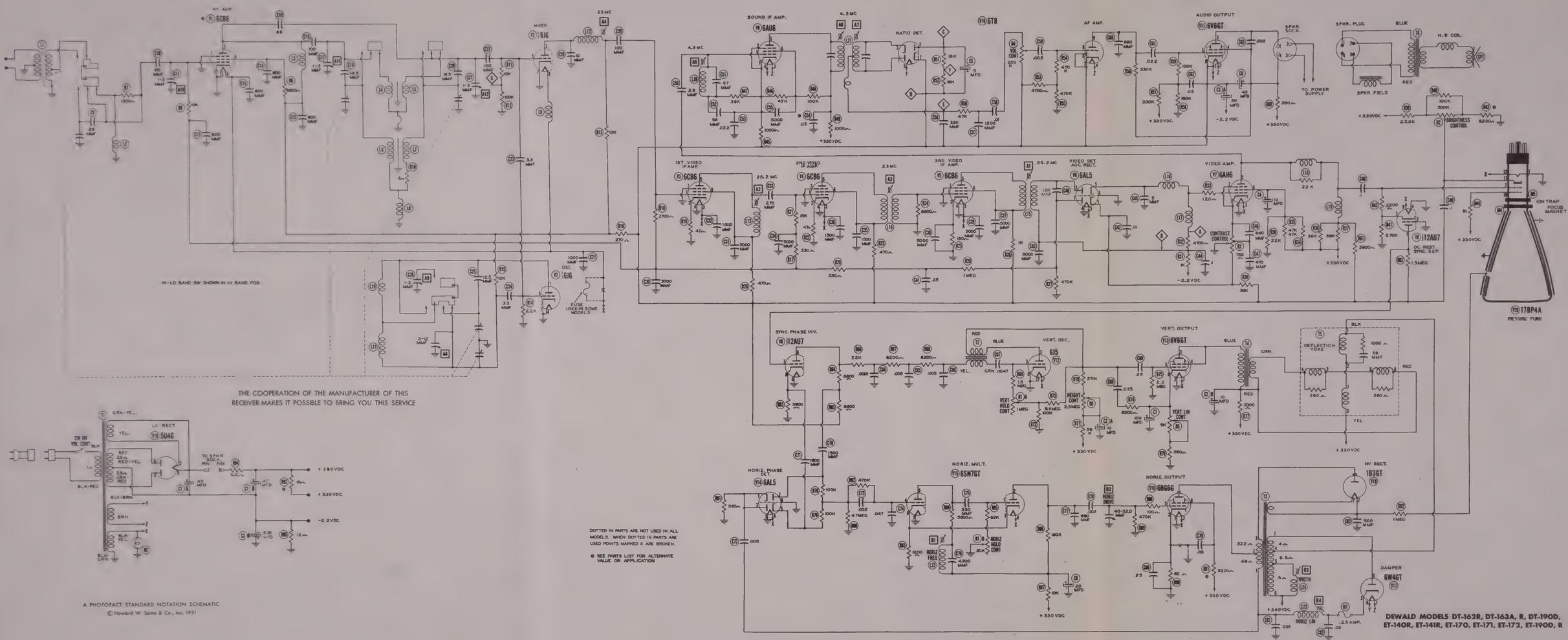

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DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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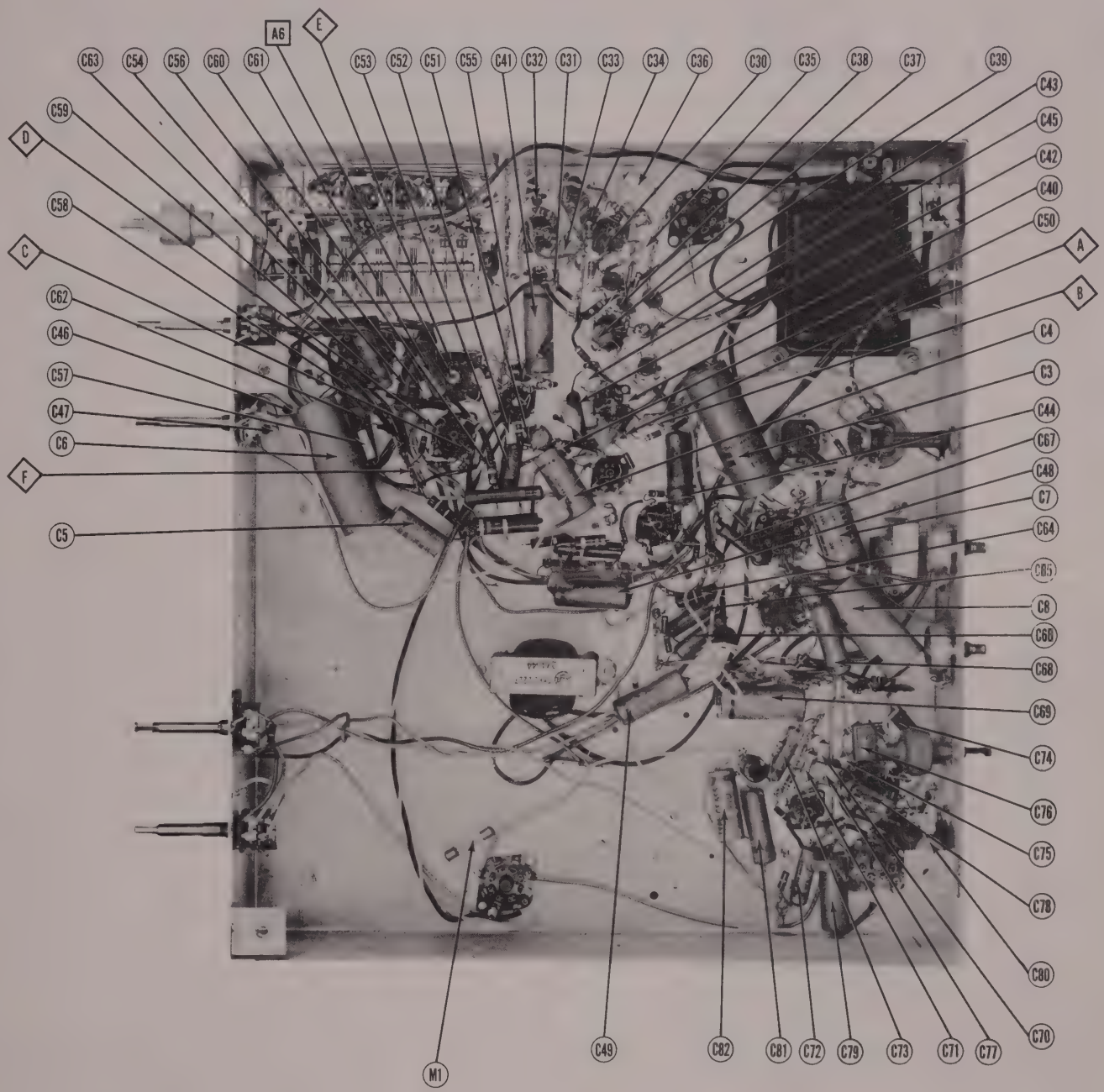
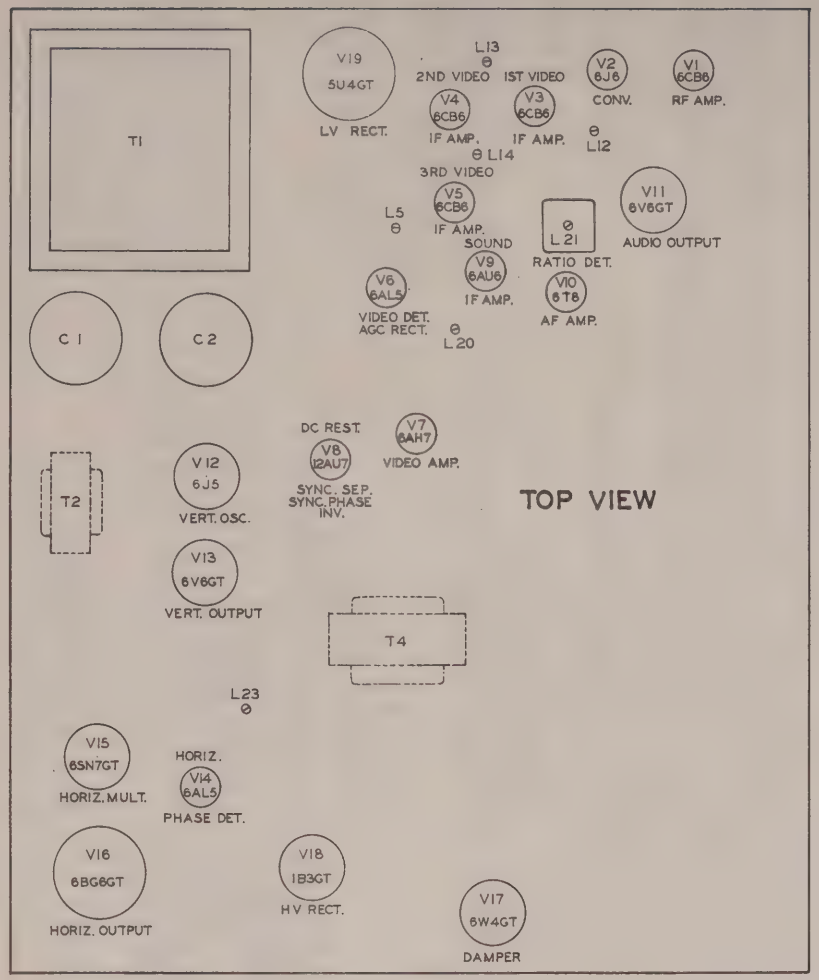
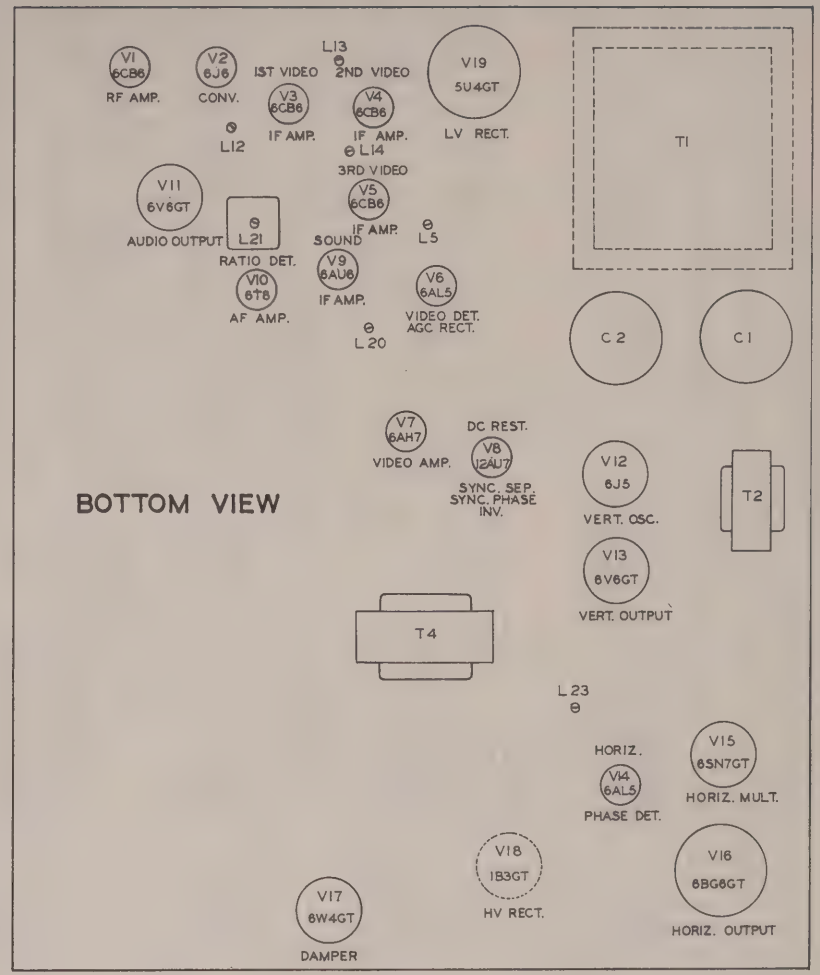
DEWALD MODELS DT-162R, DT-163A, R, DT-190D, ET-140-R, ET-141R, ET-170, ET-171, ET-172, ET-190D, R

CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW- CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

DEWALD MODELS DT-162R, DT-163A, R, DT-190D, ET-140-R, ET-141R, ET-170, ET-171, ET-172, ET-190D, R

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, (V15), from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube and replace it with a 6J6 which has Pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.

Connect the negative lead of a 3 volt battery to the ungrounded lead of C41, connect the positive lead to chassis.

During video IF alignment the common lead of the VTVM is connected to approximately 2 1/2 volts with respect to chassis. Avoid grounding the VTVM case.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	25.2MC (Unmod.)	Any	DC probe to Point (A). Common to Point (B).	A1, A2	Adjust for maximum deflection.
2.	"	"	23MC	"	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	24MC (10MC SWP)	22.5MC 24.1MC 26.35MC	Any	Vert. amp. to Point (A). Low side to chassis.		Check for response curve similar to figure 1. If necessary retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

During sound IF alignment the common lead of the VTVM is connected to approximately 140V with respect to chassis. Avoid touching or grounding the VTVM case.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to Pin 1 (grid) of 6AH6 (V7). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to Point (C). Common to Point (D).	A5, A6	Adjust for maximum deflection.
5.	"	"	"	"	DC probe to Point (E). Common to Point (F).	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulating signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to Pin 1 (grid) of 6AH6 (V7). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. amp. to Point (C). Low side to chassis.	A5, A6	Disconnect stabilizer capacitor C5. Adjust for maximum amplitude and symmetry as per figure 2.
5.	"	"	"	"	"	Vert. amp. to Point (E). Low side to chassis.	A7	Reconnect capacitor C5. Adjust A7 so 4.5MC occurs at center of crossover lines as per figure 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

TUNER ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.

Two marker generators are required to align this tuner. Marker No. 1 is coupled through a 2 or 3MMF capacitor to the grid of the first video IF amplifier. The frequency to which marker No. 1 is tuned will be indicated in the table by an asterisk (*). Marker generator No. 2 is coupled through a 2 or 3MMF capacitor across the sweep generator at the antenna terminals. If the sweep generator has a built in marker, it will be used for generator No. 2. The frequency to which Marker No. 2 is tuned will be indicated in the table by a dagger (†).

During tuner alignment it will be necessary to switch the oscilloscope input between alignment Point G , and the detector circuit, (figure 4), which is connected to the tuner output. It is, therefore, recommended that a single pole, double throw switch, mounted as close as possible to the oscilloscope terminals, be used to switch the oscilloscope input. All connecting leads should be shielded and kept as short as possible.

Leave the 3 volt bias connected as during video IF alignment.

Remove the second video IF amplifier tube to prevent IF feedback.

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

HIGH BAND OSCILLATOR ALIGNMENT

Turn the band switch to "high band" (slide switch forward).
Remove the tuner bottom cover.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to either antenna terminal. Low side to chassis.	177MC (10MC SWP)	*21.9MC †175.25MC	Tuning gang fully closed.	Vert. amp. thru detector to grid of 1st video IF amplifier.	L10	Use a non-metallic tool to adjust L10 turn spacing until markers coincide as shown in figure 5. Replace the bottom cover. If markers separate, make slight compensating adjustment of L10 so markers coincide with bottom cover in place.
7.	"	"	213MC (10MC SWP)	*26.4MC †215.75MC	Tuning gang fully open.	"	A8	With bottom cover in place adjust A8 until markers coincide. Repeat steps 6 and 7 until oscillator covers the proper range.

LOW BAND OSCILLATOR ALIGNMENT

Tune the band switch to "low band" (slide switch back).
Remove the tuner bottom cover.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to either ant. terminal. Low side to chassis.	57MC (10MC SWP)	* 21.9MC † 56.75MC	Tuning gang fully closed.	Vert. amp. thru detector to grid of 1st video IF amplifier. Low side to chassis.	L11	Use a non-metallic tool to adjust L11 turn spacing until markers coincide as shown in figure 5. Replace the bottom cover. If markers separate, make compensating adjustment of L11 so markers coincide with bottom cover in place.
9.	"	"	85MC (10MC SWP)	*26.4MC †84.35MC	Tuning gang fully open.	"	A9	With bottom cover in place adjust A9 until markers coincide. Repeat steps 8 and 9 until oscillator covers the proper range. Recheck steps 6 thru 9.

ALIGNMENT INSTRUCTIONS (CONT.)

HIGH BAND RF ALIGNMENT

Before attempting RF alignment the oscillator should be properly aligned.
Turn the band switch to "high band" (slide switch forward).
Feed the channel 7 video carrier frequency, (175.25MC) into the antenna terminals, and the sound IF frequency (21.9MC) into the first video IF grid.
Connect the oscilloscope through the detector circuit to the first video IF grid. Turn the tuning control until the markers coincide. Leave the tuning control at this position during step 10.
For step 11 adjust the tuning gang in a similar manner, except that the frequencies used are the channel 13 sound carrier (215.75MC) and the sound IF frequency (21.9MC).
Leave tuning at this position during step 11.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Direct	High side to either ant. terminal. Low side to chassis.	177MC (10MC SWP)	†175.25MC †179.75MC	7 (See instructions above)	Vert. amp. thru 10KΩ to Point G. Low side to chassis.	L4, L5, L2	If the response curve is not within the limits shown in figure 6, adjust L4 and L5 by pushing the coils on or off the brass studs for proper bandwidth and then adjust L2 in the same manner for amplitude and symmetry. Proper adjustment of L4 and L5 is attained when a slight variation of either winding causes the response curve to shift frequency without noticeable change in bandwidth. L2 is properly adjusted when a slight change causes the response to rock evenly. The bandwidth of channel 7 is adjusted by altering the position of L4 and L5 ground leads past the cutout in the shield plate. For maximum gain the bandwidth should be made as narrow as possible with the markers still at the top of the peaks. Replace cover and observe the pass band.
11.	"	"	213MC (10MC SWP)	†211.25MC †213.75MC	13	"	A10, A11, A12	Adjust for maximum amplitude with sufficient bandwidth as per figure 6. Recheck step 10.

LOW BAND RF ALIGNMENT

Turn the band switch to "low band" (slide switch back).
Set the tuning gang to channel 2 in the manner outlined under high band alignment, using the channel 2 sound carrier frequency, (59.75MC) and the sound IF frequency (21.9MC). Leave at this frequency during step 12.
For step 13 set the tuning to channel 6 by using 87.75MC and 21.9MC.
Leave at this setting during step 13.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Direct	High side to either ant. terminal. Low side to chassis.	57MC (10MC SWP)	†55.25MC †59.75MC	2	Vert. amp. to Point G. Low side to chassis.	L6, L7, L1, L8	Adjust L6 and L7 by expanding or compressing coils for maximum amplitude with proper bandwidth. Expand or compress coil turns of L1 secondary for maximum amplitude and symmetry of response. Adjustment of L6 and L7 is correct when a slight change of either winding causes no noticeable change of bandwidth. L1 secondary is properly adjusted when a slight change causes the peaks to rock evenly. Bandwidth is adjusted by varying the turn spacing of the coupling coil L8.
13.	"	"	85MC (10MC SWP)	†83.25MC †87.75MC	6	"		With bottom cover in place, check the channel 6 response to see if it is within the limits of figure 6. If not remove bottom cover and make compromise adjustments of L1 and L8. Recheck channel 2.

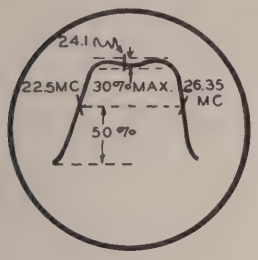


FIG.1

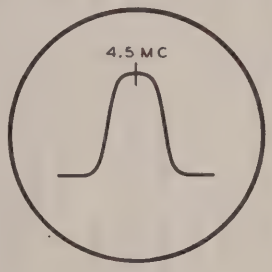


FIG. 2

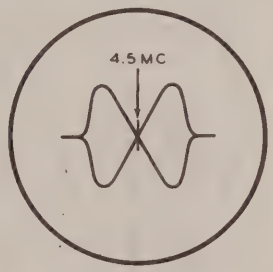


FIG. 3

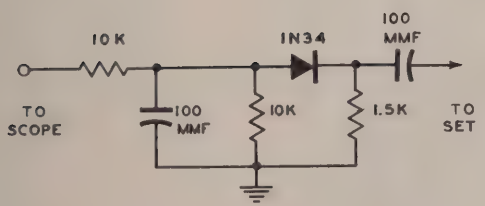


FIG. 4

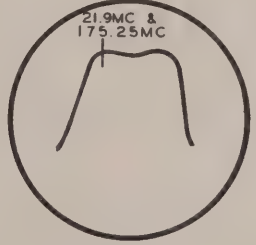


FIG. 5

FIG.6

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	▲-.8VDC ■-.2VDC	0V	0V	6.3VAC	115VDC	95VDC	0V		
V 2	6J6	▲85VDC ■65VDC	▲75VDC ■80VDC	6.2VAC	0V	▲-1VDC ■-2.8VDC	§▲-5.2VDC §■-3.2VDC	0V		
V 3	6CB6	-.8VDC	.5VDC	6.3VAC	0V	110VDC	115VDC	0V		
V 4	6CB6	-.8VDC	.2VDC	6.3VAC	0V	110VDC	115VDC	0V		
V 5	6CB6	0V	1.6VDC	6.3VAC	0V	105VDC	110VDC	0V		
V 6	6AL5	.1VDC	-2.2VDC	6.3VAC	0V	-.4VDC	0V	-.3VDC		
V 7	6AH7	-2VDC	1.4VDC	6.3VAC	0V	145VDC	150VDC	1.4VDC		
V 8	12AU7	17VDC	0V	2VDC	0V	0V	60VDC	17VDC	85VDC	6.3VAC
V 9	6AU6	†3.7VDC	†5VDC	†6.3VAC	† 0V	#195VDC	†39VDC	†5VDC		
V 10	6T8	†-.3VDC	†-1.1VDC	†-.8VDC	†6.3VAC	† 0V	† 0V	† 0V	†-.5VDC	†75VDC
V 11	6V6GT	0V	†0V	†160VDC	†180VDC	†-5VDC	†-5.2VDC	†6.3VAC	120VDC	
V 12	6J5	0V	0V	100VDC	8.4VDC	-4.8VDC	0V	6.3VAC	0V	
V 13	6V6GT	0V	0V	230VDC	230VDC	-.6VDC	0V	6.3VAC	8.5VDC	
V 14	6AL5	0V	0V	0V	6.3VAC	7.8VDC	0V	-9.4VDC		
V 15	6SN7GT	-3.5VDC	110VDC	8.8VDC	-.2VDC	235VDC	8.8VDC	0V	6.3VAC	
V 16	6BG6	0V	6.3VAC	7VDC	0V	-9.8VDC	-1.1VDC	0V	255VDC	TOP CAP *
V 17	6W4GT	120VDC	550VDC	550VDC	0V	325VDC	0V	#6.3VAC	#0V	
V 18	1B3GT	* DO NOT MEASURE								
V 19	5U4G	0V	400VDC	0V	340VAC	0V	340VAC	0V	400VDC	
V 20	17BP4A	0V	2VDC	PIN 10 340VDC	PIN 11 48VDC	PIN 12 6.3VAC				

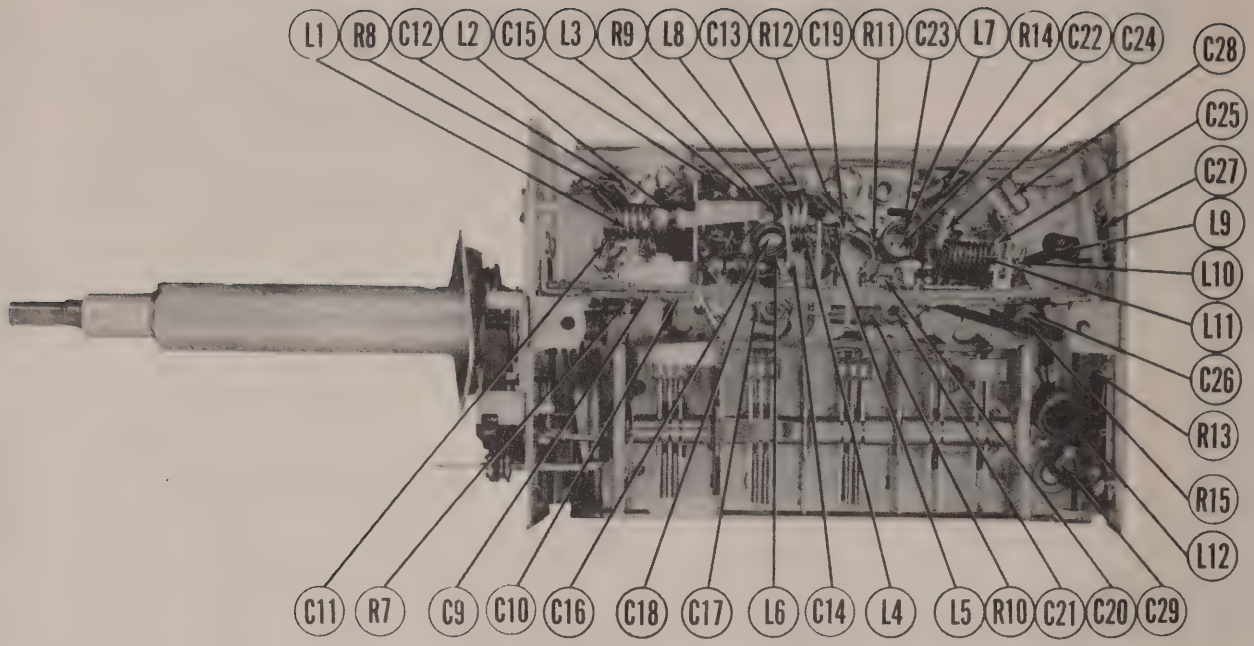
ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
† MEASURED FROM PIN 8 OF V19
# MEASURED FROM PIN 3 OF V17
▲ TAKEN IN LOW BAND RANGE POSITION
■ TAKEN IN HIGH BAND RANGE POSITION
‡ MEASURED FROM PIN 8 OF V11
* DO NOT MEASURE
§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	1.5Meg	0Ω	0Ω	.1Ω	‡270Ω	‡7KΩ	0Ω		
V 2	6J6	‡10KΩ	‡10KΩ	.1Ω	0Ω	110KΩ	22KΩ	0Ω		
V 3	6CB6	1.5Meg	47Ω	.1Ω	0Ω	‡470Ω	‡470Ω	0Ω		
V 4	6CB6	1.5Meg	47Ω	.1Ω	0Ω	‡ 470Ω	‡470Ω	0Ω		
V 5	6CB6	.3Ω	150Ω	.1Ω	0Ω	‡1KΩ	‡1KΩ	0Ω		
V 6	6AL5	‡39KΩ	1KΩ	.1Ω	0Ω	5.7KΩ	0Ω	470KΩ		
V 7	6AH7	5.8KΩ	750Ω	.1Ω	0Ω	‡5.6KΩ	16KΩ	750Ω		
V 8	12AU7	‡1.5Meg	0Ω	270KΩ	0Ω	0Ω	‡14KΩ	‡1.5Meg	3.9KΩ	.1Ω
V 9	6AU6	‡40KΩ	‡1KΩ	‡.1Ω	‡0Ω	†1.8KΩ	‡48KΩ	‡1KΩ		
V 10	6T8	Inf.	‡36KΩ	Inf.	‡.1Ω	‡0Ω	‡0Ω	‡0Ω	‡475KΩ	†330KΩ
V 11	6V6GT	0Ω	‡.1Ω	†1.7KΩ	†1.1KΩ	280KΩ	180KΩ	‡0Ω	20KΩ	
V 12	6J5	0Ω	0Ω	†400KΩ †2.8Meg	8.2KΩ	2.5Meg	Inf.	.1Ω	0Ω	
V 13	6V6GT	0Ω	0Ω	†4KΩ	†4KΩ	2.2Meg	Inf.	.1Ω	390Ω 5.5KΩ	
V 14	6AL5	560Ω	560Ω	0Ω	.1Ω	4.8Meg	0Ω	4.8Meg		
V 15	6SN7GT	112KΩ	†190KΩ	1.2KΩ	5Meg	†16KΩ	1.2KΩ	0Ω	.1Ω	
V 16	6BG6	Inf.	.1Ω	82Ω	Inf.	480KΩ	50KΩ	0Ω	†10KΩ	TOP CAP #85Ω
V 17	6W4GT	20KΩ	#4.5Ω	Inf.	Inf.	†760Ω	Inf.	‡.1Ω	‡0Ω	
V 18	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #405Ω
V 19	5U4G	Inf.	24KΩ	Inf.	35Ω	Inf.	35Ω	Inf.	24KΩ	
V 20	17BP4A	0Ω	272KΩ	PIN 10 †1.7KΩ	PIN 11 80KΩ	PIN 12 .1Ω				

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
† MEASURED FROM PIN 8 OF V19
# MEASURED FROM PIN 3 OF V17
‡ MEASURED FROM PIN 8 OF V11

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

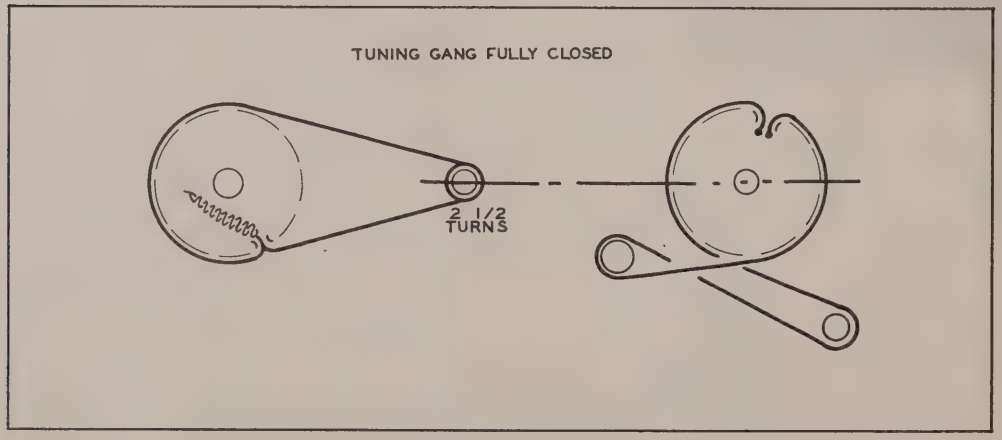


RF TUNER – BOTTOM VIEW

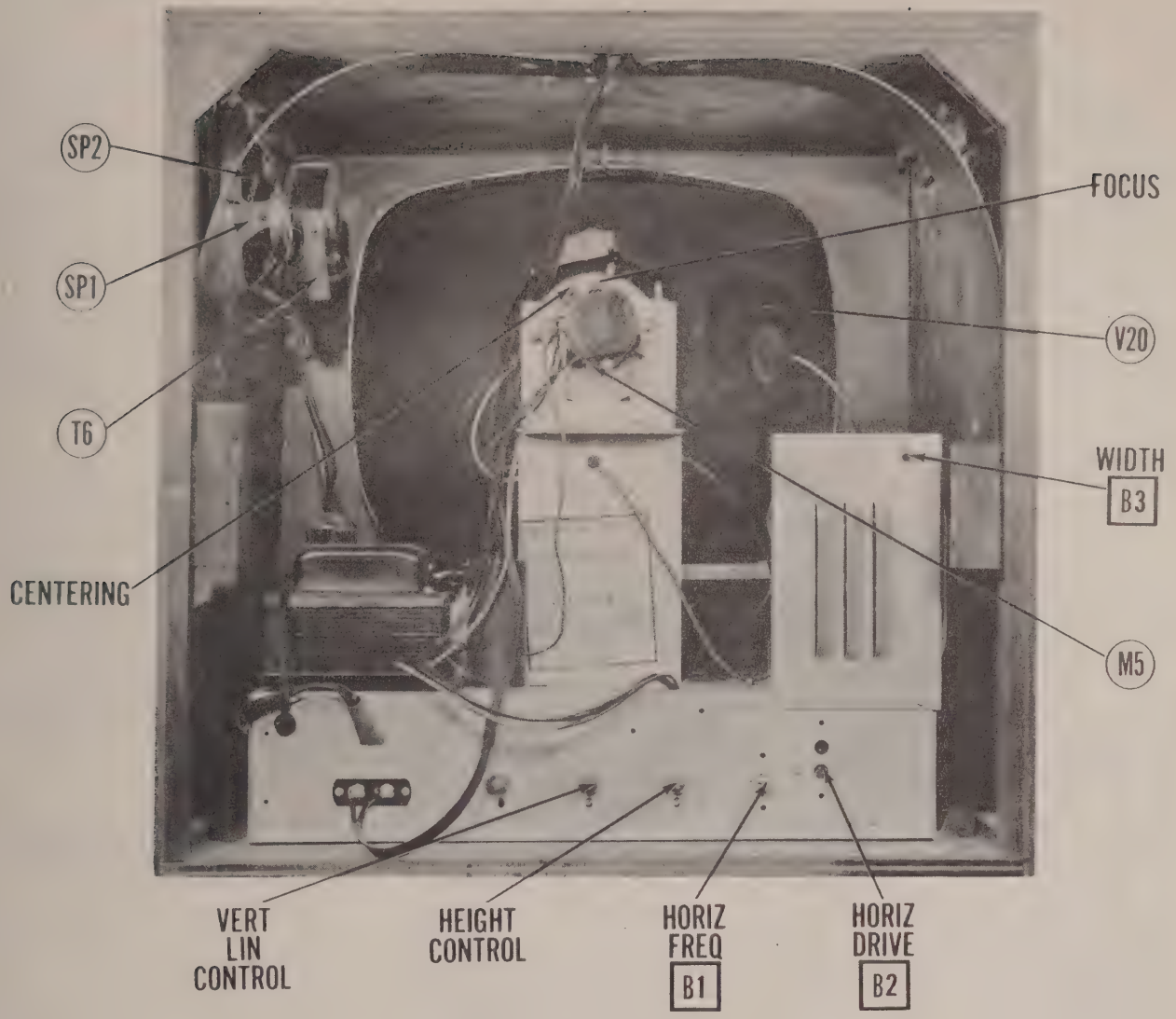
DISASSEMBLY INSTRUCTIONS

1. Remove eight push-on type control knobs.
2. Remove two hex head screws from rear cover. Remove rear cover.
3. Disconnect built-in antenna.
4. Disconnect speaker.
5. Remove four hex head bolts from chassis. Remove chassis.
6. Remove two hex nuts from speaker.

NOTE: FOR PICTURE TUBE REMOVAL, IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.



DRIVE CORD STRINGING



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid position of its range.

Adjust the horizontal frequency slug, (B1), until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer, (B2), counter-clockwise as far as possible without crowding, or vertical lines appearing in the picture.

Adjust the width slug, (B3) until the picture fills the mask horizontally.

Adjust the horizontal linearity slug, (B4), until the picture is symmetrical from left to right. Slight readjustment of B2 may be required for optimum results.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6CB6	6CB6	6CK	
B	RF Amplifier	6BC5	6BC5	7BD	
C	RF Amplifier	6AG5	6AG5	7BD	
V2	Converter	6J8	6J8	7BF	
V3	1st Video IF Amp.	6CB6	6CB6	6CK	
V4	2nd Video IF Amp.	6CB6	6CB6	6CK	
V5	3rd Video IF Amp.	6CB6	6CB6	6CK	
V6	Video Detector - AGC Rectifier	6AL5	6AL5	6BT	
V7	Video Amplifier	6AH6	6AH6	7BK	
V8	DC Restorer - Sync. Separator - Sync. Phase Inverter	12AU7	12AU7	9A	
V9	Sound IF Amplifier	6AU6	6AU6	7BK	
V10	Ratio Detector - AF Amplifier	6T8	6T8	9E	In some models, a 6AL5 and a 6AT6 are used in place of V10 (6T8).
V11	Audio Output	6V6GT	6V6GT	7AC	
V12	Vertical Oscillator	6J5	6J5	6Q	
V13	Vertical Output	6V6GT	6V6GT	7AC	
V14	Horiz. Phase Det.	6AL5	6AL5	6BT	
V15	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V16	Horiz. Output	6BG6GT	6BG6GT	5BT	
V17	Damper	6W4GT	6W4GT	4CG	
V18	H. V. Rectifier	1B3GT	1B3GT	3C	
V19	L. V. Rectifier	5U4G	5U4G	5T	
V20	Picture Tube	17BP4A	17BP4A	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450		AFH88J		UPT4445		TVL-2764	▲ Filter
B	40	450							▲ Filter
C2A	10	450		AFH22J		UP1145		TVL-2750	▲ Vert. Osc. Dec. ▲ Vert. Output Dec.
B	10	450							
C3A	50	250		PRS450/40		BR5025		TVA-1511	Decoupling
B	500	5		PRS6/500		BRH505A		TVA-1103	Bias Filter
C4	10	250		PRS250/12		BR1225A		TVA-1504	V. Amp. Screen
C5	5	50		PRS150/4		BR550		TVA-1303	Stabilizing Cap
C6	40	450		PRS450/40		BR4045A		TVA-1712	Filter
C7	100	50		PRS50/100		BRH50I		TVA-1310	Vert. Output Cath.
C8	20	450		PRS450/20		BR2045A		TVA-1709	Decoupling
C9	29						N150K-290		Fixed Padder
C10	100			SI100	D6-101		GP1K-101	19C11	RF Coupling
C11	1-3				829-3				Variable Trimmer
C12	800			BPD-008	DD-801		801-001	19C1	AGC Filter
C13	800			BPD-008	DD-801		801-001	19C1	RF Bypass
C14	800			BPD-008	DD-801		801-001	19C1	RF Amp. Screen
C15	800			BPD-008	DD-801		801-001	19C1	RF Amp. Fil.
C16	100			SI100	D6-101		GP1K-101	19C11	RF Coupling
C17	1-3				829-3				Variable Trimmer
C18	14.5								Fixed Padder
C19	.68				TCZ-.68				RF Coupling
C20	18.5								Fixed Padder
C21	1-3				829-3				Variable Trimmer
C22	100			SI100	D6-101		GP1K-101	19C11	RF Coupling
C23	3.3			SI3.3NPO	TCZ-3.3		NPOK-3.3		Osc. Coupling
C24	33			SI33	D6-330		GP1K-330	19C24	Osc. Grid Cap
C25	12.5								Fixed Padder
C26	1-3				829-3				Variable Trimmer
C27	1000			BPD-001	DD-102		801-001	19C1	Filament Bypass
C28	10			SI10N750	TCN-10		N750K-100	19C4	Fixed Trimmer
C29	100			SI100	D6-101		GP1K-101	19C11	IF Coupling
C30	5000			BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C31	5000			BPD-005	DD-502	1D5D5	811-005	29C1	1st V. IF Dec.
C32	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	1st V. IF Fil.
C33	270	500		SI270	D6-271	5W5T25	GP2K-271	19C31	IF Coupling
C34	5000			BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C35	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	2nd V. IF Dec.
C36	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	2nd V. IF Fil.
C37	5000			BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Dec.
C38	5000			BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Cathode
C39	5000			BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Fil.
C40	120			SI120	D6-121	5W5T15	GP2K-121	19C29	IF Coupling
C41	.25	200		P488-25		GT2P25		2TM-P25	AGC Filter
C42	.01	400		P488-01	D6-103	PTE4S1	821-01	4TM-S1	DAGC Dec.
C43	5000			BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C44	.1	200		P288-1	DF-104	PTE4P1		2TM-P1	RF Bypass
C45	5			SI5	TCZ-4.7	5W5V5	GP1K-050	MS-55	V. Diode Filter
C46	680			SI680	D6-681	1W5T7	GP2K-681	19C17	V. Amp. Cathode
C47	470			SI470	D6-471	5W5T5	GP2K-471	19C15	V. Amp. Cathode
C48	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C49	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Pic. Tube Cathode
C50	2.5				TCZ-2.2				S. IF Coupling
C51	47			SI47N750	TCN-47		N750K-471	19C9	Fixed Trimmer
C52	68			SI68	D6-680	5W5Q7	GP1K-680	19C10	S. IF Grid
C53	.022	600		P686-022	DF-203	PTE6S2		6TM-S22	S. IF Dec.
C54	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	S. IF Dec. *
C55	5000			BPD-005	DD-502	1D5D5	811-005	29C1	S. IF Screen
C56	330			SI330	D6-331	5W5T3	GP2K-331	19C24	Diode Load Cap
C57	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	De-emphasis
C58	.01	400		P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C59	.005	600		P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C60	680			SI680	D6-681	1W5T7	GP2K-681	19C17	AF Amp. Plate
C61	.022	600		P686-022	DF-203	PTE6S2		6TM-S22	Audio Coupling
C62	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Bias Filter

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C63	.005	600		P686-005	D6-502	PTE6D5	GP2-335-005	6TM-D5	Output Plate
C64	.0018	600		P686-002	D6-202	PTE6D2	GP2-333-182	6TM-D2	Integrator Net
C65	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Integrator Net
C66	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Integrator Net
C67	.0047	600		P686-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Vert. Osc. Grid
C68	.035	600		P686-035		PTE6S3		6TM-S3	Vert. Discharge
C69	.25	400		P488-25		GT4P25		4TM-P25	Vert. Sweep Coupling
C70	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	Horiz. Sync. Coupling
C71	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	Horiz. Sync. Coupling
C72	.005	600		P686-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Horiz. Feedback
C73	.005	600		P686-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	AFC Filter
C74	.047	200		P288-047	DF-503	PTE4S5		2TM-S47	AFC Filter
C75	330	500		SI330	D6-331	5W5T3	GP2K-331	19C14	Horiz. MV Feedback
C76	4300	500							Fixed Trimmer
C77	680	500		SI680	D6-681	1W5T7	GP2K-681	19C17	Horiz. Discharge
C78	.002	600		P686-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Horiz. Sync. Coupling
C79	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Output Screen
C80	.25	200		P488-25		GT2P25		2TM-P25	Horiz. Output Cathode
C81	.035	600		P688-033					Damper Filter
C82	.05	600		P688-05		PTE6S5		6TM-S5	Damper Filter
C83	500	20000		HV20C	TV3-502				H.V. Filter

* Some models use .02MFD in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg	½	3034A-2	Concentrikit			
B	30KΩ	½		Bll-137 ♯	RTV-2	SBB-583	Vertical Hold Control - Front
C	Shaft End			Bll-121 ♯			Horizontal Hold Control - Rear
R2A	500KΩ	½	3031A-7	E-187 ♯			Attach Per Instructions in "Concentrikit"
B	Shaft		Not req.	Q11-133	AM-58-8	AN-59	Brightness Control
R3	750Ω	½	3040-1	Not req.	KSS-3	AK-4	Attach to R2A Per Instructions
R4A	250KΩ	½	3031A-12	Q13-130	AG-64-Z	AN-51	Contrast Control - Tapped @ 500Ω
B	Shaft		Not req.	Not req.	KSS-3	AK-4	Volume Control
C	Switch		Not req.	76-1	SWB	K-155	Attach to R4A Per Instructions
R5A	5000Ω	½	3031A-4	Q11-114	AM-19-8	AN-10	Attach to R4A Per Instructions
B	Shaft		Not req.	Not req.	FKS-1/4	AK-1	Vertical Linearity Control
R6A	2.5Meg	½	3031A-5	Q11-239	AM-84-S	AN-83	Attach to R5A Per Instructions
B	Shaft		Not req.	Not req.	FKS-1/4	AK-1	Height Control

♯ Additional parts to be used with "Concentrikit"

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R7	1500Ω	1		BTS-1500	Antenna Coil Shunt
R8	10KΩ	1			RF Amp. Grid
R9	6800Ω 20%	1			RF Amp. Screen
R10	6Ω 20%	1			Parasitic Suppressor
R11	10KΩ	1			Mixer Grid
R12	100KΩ 20%	1			Mixer Grid
R13	10KΩ 20%	1			Mixer Plate
R14	22KΩ 20%	1			Osc. Grid
R15	10KΩ 20%	1			Osc. Plate
R16	270Ω 20%	1		BTS-270	Decoupling
R17	330Ω	1		BTS-330	AGC Network
R18	2700Ω	1		BTS-2700	1st Video IF Amp. Grid
R19	47Ω	1			1st Video IF Amp. Cathode
R20	470Ω	1		BTS-470	1st Video IF Amp. Decoupling
R21	15KΩ	1			2nd Video IF Amp. Grid
R22	47Ω 20%	1			2nd Video IF Amp. Cathode
R23	470Ω	1		BTS-470	2nd Video IF Amp. Decoupling
R24	6800Ω 20%	1			3rd Video IF Transformer Shunt
R25	180Ω	1		BTS-180	3rd Video IF Amp. Cathode
R26	1000Ω 20%	1		BTS-1000	3rd Video IF Amp. Decoupling
R27	470KΩ	1		BTS-470K	AGC Load
R28	1Meg	1		BTS-1Meg	AGC Network
R29	330Ω	1		BTS-330	AGC Network
R30	39KΩ	1		BTA-39K	Bias Network
R31	1000Ω 20%	1		BTS-1000	Bias Network
R32	4700Ω 20%	1		BTS-4700	Video Det. Diode Load
R33	120Ω	1			Parasitic Suppressor
R34	47KΩ	2		BTB-47K	Video Amp. Screen
R35	47KΩ	2		BTB-47K	Video Amp. Screen
R36	56KΩ	2		BTB-56K	Video Amp. Plate
R37	56KΩ	2		BTB-56K	Video Amp. Plate
R38	22KΩ 20%	2		BTB-22K	Voltage Divider
R39	220KΩ 20%	2		BTS-220K	Voltage Divider
R40	100KΩ 20%	2		BTS-100K	Brightness Control Shunt
R41	270KΩ	2		BTS-270K	DC Restorer Diode Load
R42	2200Ω 20%	2		BTS-2200	Picture Tube Grid
R43	8200Ω	2		BTS-8200	Picture Tube Cathode - See Note 1
R44	1000Ω 20%	2		BTS-1000	Acc. Anode Load
R45	1000Ω	2		BTS-1000	Bias Network
R46	47KΩ	2		BTS-47K	Voltage Divider
R47	39KΩ	1		BTS-39K	Sound IF Amp. Grid
R48	100KΩ	1		BTS-100K	Sound IF Amp. Screen
R49	1000Ω	1		BTS-1000	Sound IF Amp. Decoupling
R50	47KΩ	1		BTS-47K	De-emphasis
R51	18KΩ	1		BTS-18K	Ratio Det. Diode Load
R52	18KΩ	1		BTS-18K	Ratio Det. Diode Load
R53	4700Ω	1		BTS-4700	Bias Network
R54	470KΩ	1		BTS-470K	AF Amp. Grid
R55	470KΩ	1		BTS-470K	AF Amp. Grid
R56	330KΩ	1		BTS-330K	AF Amp. Plate
R57	330KΩ	1		BTS-330K	Bias Network
R58	180KΩ	1		BTS-180K	Bias Network

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R59	100KΩ	1		BTS-100K	Output Grid
R60	390Ω	1		BTA-390	Decoupling
R61	5600Ω	1		BTA-5600	Voltage Divider
R62	1.5Meg 20%	½		BTS-1.5Meg	Sync. Sep. Plate
R63	3900Ω 20%	½		BTS-3900	Sync. Phase Inv. Cathode
R64	6800Ω 20%	½		BTS-6800	Sync. Phase Inv. Plate
R65	6800Ω 20%	½		BTS-6800	Sync. Phase Inv. Plate
R66	22KΩ 20%	½		BTS-22K	Integrator
R67	8200Ω 20%	½		BTS-8200	Integrator
R68	8200Ω 20%	½		BTS-8200	Integrator
R69	1.5Meg 20%	½		BTS-1.5Meg	Vertical Oscillator Grid
R70	270KΩ 20%	½		BTS-270K	Vertical Oscillator Plate
R71	56KΩ 20%	½		BTS-56K	Vertical Oscillator Decoupling
R72	100KΩ 20%	½		BTS-100K	Voltage Divider
R73	6.8Meg 20%	½		BTS-6.8Meg	Voltage Divider
R74	8200Ω 20%	½		BTS-8200	Vertical Peaking
R75	2.2Meg 20%	½		BTS-2.2Meg	Vertical Output Grid
R76	390Ω	1		BTA-390	Vertical Output Cathode
R77	3300Ω 20%	1		BTA-3300	Vertical Output Decoupling
R78	100KΩ 20%	½		BTS-100K	Horizontal Phase Det. Diode Load
R79	100KΩ 20%	½		BTS-100K	Horizontal Phase Det. Diode Load
R80	4.7Meg 20%	½		BTS-4.7Meg	Horizontal Phase Det. Diode Load
R81	560Ω	1		BTA-560	Horizontal Phase Det. Diode Load
R82	470KΩ	½		BTS-470K	Horizontal AFC Filter
R83	1200Ω	½		BTS-1200	Horizontal MV Cathode
R84	5600Ω 20%	½		BTS-5600	Horizontal MV Plate
R85	82KΩ	½		BTS-82K	Horizontal MV Grid
R86	180KΩ	½		BTS-180K	Horizontal MV Plate
R87	10KΩ 20%	1		BTA-10K	Horizontal MV Decoupling
R88	100Ω 20%	½			Parasitic Suppressor
R89	470KΩ	½		BTS-470K	Horizontal Output Grid
R90	82Ω	2		BW-2-82	Horizontal Output Cathode
R91	9200Ω	1			Horizontal Output Screen - See Note 2
R92	1Meg 20%	1			HV Filter
R93	10Ω	½			Filter Network - See Note 2
R94	300Ω	15		2D-300	Filter - Wire Wound
R95	12Ω 20%	½		BW-½-12	Bias Network

Note 1. Some models use 22KΩ resistor in this application.
Note 2. Some models use series resistors in this application to obtain desired value.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC @ 1.7A	720VCT .180ADC	5VAC	6.3VAC SEC. 4 6.3VAC @ 5.6A	1130A			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	130Ω	73Ω	1109-A-4	A-8121 ①	A-3000 ① HV0-6	TB0-1 ①	Vertical Block Osc. Trans. Horizontal Output Trans.
T3	370Ω Tap @ 48Ω	11Ω Taps .5Ω and 7Ω	1120A-2				
T4	1.2KΩ Taps 12Ω		1110-4	A-8123	A-3037		Vertical Output Trans.
T5A	13.5Ω		1121D-3	DY-7	MDF 70		Horizontal Deflection Coil
B	63Ω						Vertical Deflection Coil

① Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T6	4.8KΩ	3.6Ω	450Ω	.5Ω	1122-2	A-3849 ①	A-3019 ①	R0-9 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	82Ω	3.6Ω	7029		6E62S	
	CONE DIA.	V. C. DIA.				
SP2	5 7/8"	9/16"				

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	DEWALD PART No.	MEISSNER PART No.	
L1	Low Band Ant.	.2Ω	.1Ω			
L2	High Band Ant.	0Ω				
L3	RF Choke	.2Ω				
L4	High Band RF Coil Primary	0Ω				
L5	High Band RF Coil Secondary	0Ω				
L6	Low Band RF Coil Primary	0Ω				
L7	Low Band RF Coil Secondary	0Ω				
L8	RF Coupling	0Ω				
L9	Fil. Choke	0Ω		1129		
L10	High Band Osc	0Ω				
L11	Low Band Osc	0Ω				
L12	1st. Video IF	1.1Ω				
L13	2nd. Video IF	.3Ω				
L14	3rd. Video IF	.3Ω	.3Ω			
L15	4th. Video IF	.3Ω	.3Ω			
L16	Peaking Coil	5.5Ω		1085A		120 Microhenries (Red and Blue Dot)
L17	Peaking Coil	15Ω		1085A		600 Microhenries
L18	Peaking Coil	9.5Ω		1085A		275 Microhenries (Wound on 22KΩ Resistor)
L19	Peaking Coil	11Ω		1085A		400 Microhenries (Blue Dot)
L20	1st. Sound IF	2.5Ω		1132A		
L21	Ratio Det. Transformer	4.4Ω	.8Ω	1114		Tap 1Ω
L22	Horiz. Osc. Coil	110Ω		1098B		
L23	Horiz. Lin.	35Ω		1079A		
L24	Width Coil	.3Ω				

FUSES

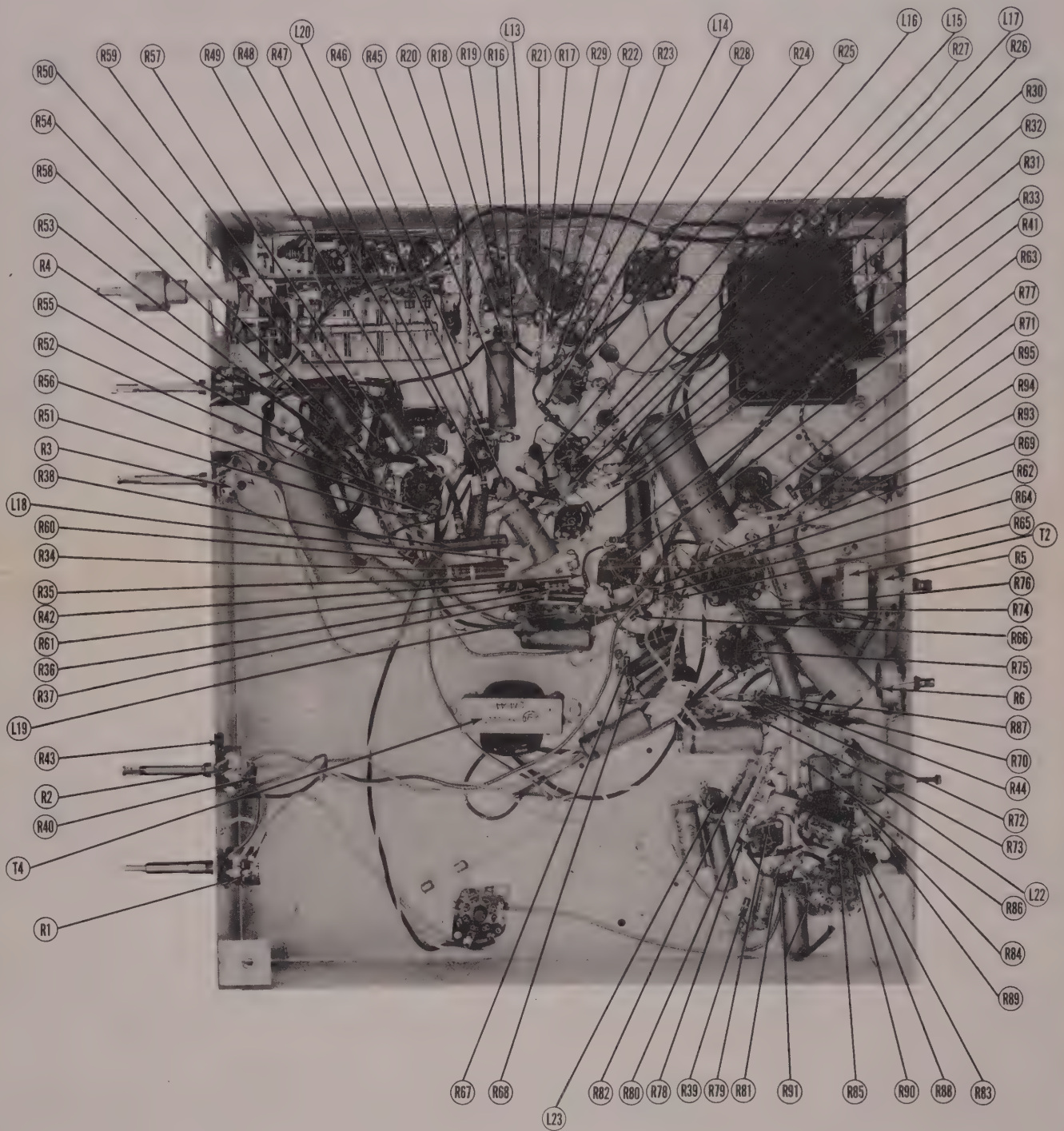
ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			DEWALD PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG Pigtail	.250	8054-1		318.250		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					DEWALD PART No.		
M2	Bayonet	6-8	.15	Brown			Type #47

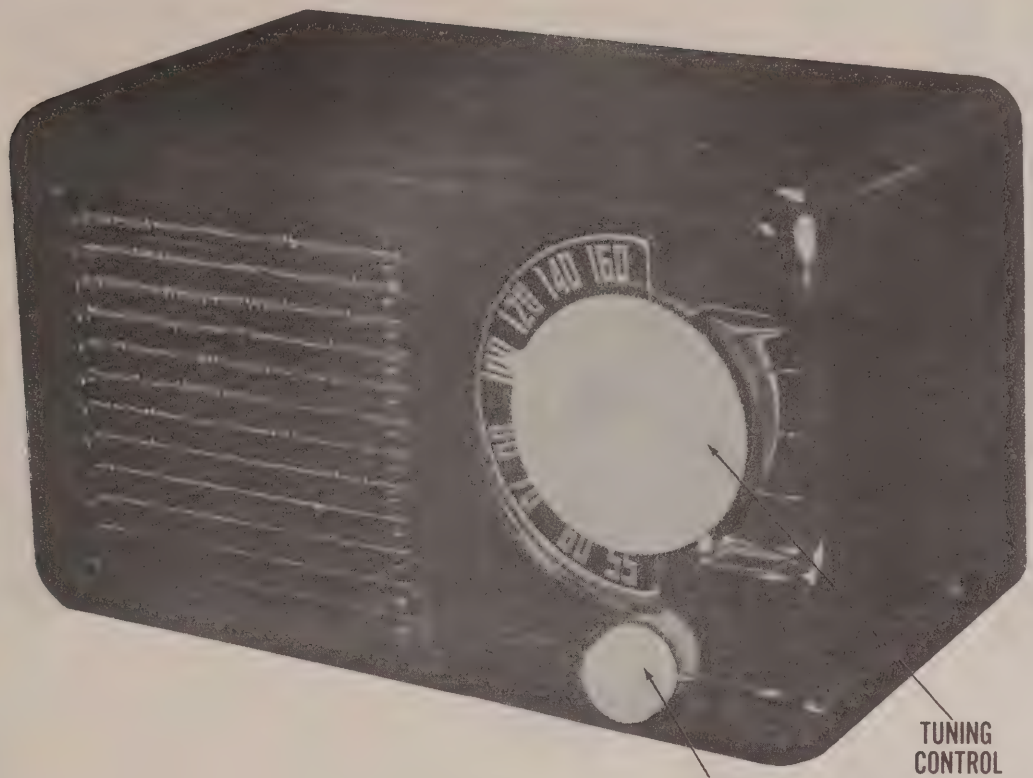
MISCELLANEOUS

ITEM No.	PART NAME	DEWALD PART No.	NOTES
M3	RF Tuner	7023B-1	
M4	Focus Magnet		
M5	Ion Trap	8073-1	
B2	Trimmer	2051-2	Horizontal Drive
	Knob	4130-1	Brightness, Volume, Contrast
	Knob	4146-1	Vertical Hold
	Knob	4130-3	Horizontal Hold
	Knob	4130-4	Fine Tuning



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

FIRESTONE
MODEL 4-A-70



FIRESTONE
MODEL 4-A-70

TRADE NAME	Firestone, Model 4-A-70 (Code 297-0-299)
SUPPLIER	Firestone Tire & Rubber Co., Akron, Ohio
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FOUR)	Types 12AU6 Converter, 12AV6 DET.-AF Amp., 50C5 Power Output, 35Z5GT and 35W4 Rectifier
POWER SUPPLY	110-120 AC-DC — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set the pointer straight down.
Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD.	High side to stator on rear section of tuning gang.	455KC (400~ Mod.)	Quiet point near center of tuning range.	Across voice coil.	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	Tuning gang fully open.	"	A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output
3.		Loop	1400KC	Tune for max. output.	"	A4	"

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PARTS LIST AND DESCRIPTIONS

FIRESTONE MODEL 4-A-70

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		FIRESTONE PART No.	STANDARD REPLACEMENT		
V1	Converter	12AU6	12AU6	7BK	
V2	Det.-AF Amp.	12AV6	12AV6	7BT	
V3	Power Output	50C5	50C5	7CV	
V4A	Rectifier	35Z5	35Z5	6AD	
B	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	150	N-7153	PRS86D4A		EDL4215C		TVA-3423	Filter Blue
B	20	150							Filter Red
C	20	15							Output Cathode Green
C2	50	500	N-6385	1468-00005	D6-500	5W5Q5	GP1K-500	1FM-45	RF Coupling
C3	.05	200	N-1345	P288-05	DF-503	PTE4S5		72P51	Line Isolation
C4	100		N-6015	S1100	D6-101	5W5T1	GP1K-101	19C11	Diode RF Filter
C5	.003	600		P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	Audio Coupling
C6A	100			S1100	*PC-71	5W5T1	GP1K-101	19C11	AF Amp. Plate
B	10000			BPD-01		PTE4S1	821-01	36C1	Audio Coupling
C7	.01	400	N-1344	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Output Plate
C8	.05	400	N-1346	P488-05	DF-503	PTE4S5		4TM-S5	Rect. Plate

* Items C6A, C6B, R4A, and R4B are combined into one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	FIRESTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	2Meg	½	N-7142	Q13-139	AG-66-Z	AN-76	Volume Control
B	Shaft		Not req.	Not req.	KSS-3	AK-4	Attach to R1A per instructions
C	Switch		Not req.	76-1	SWB	K-155	Attach to R1A per instructions

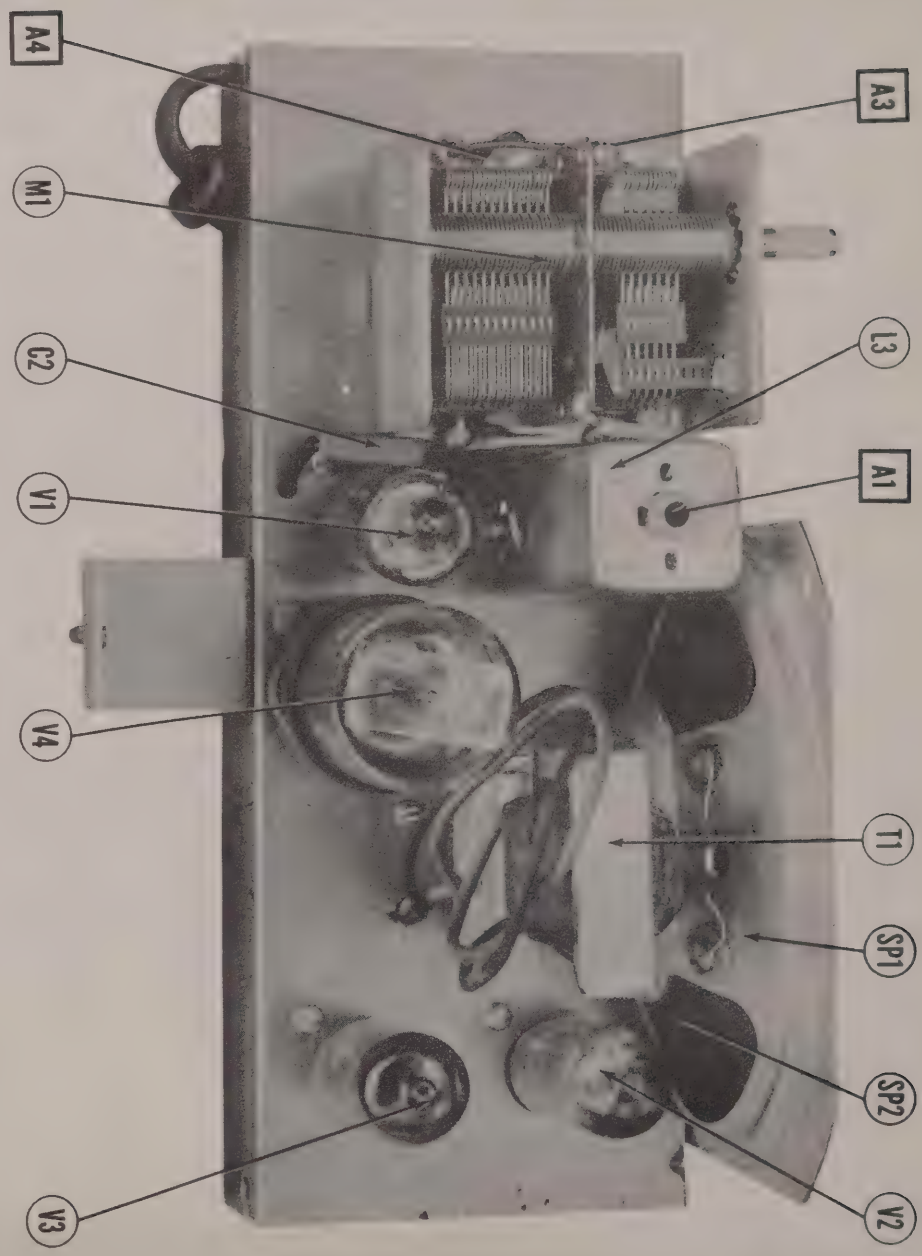
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	FIRESTONE PART No.	IRC PART No.	
R2	2.2Meg	½	N-4277	BTS-2.2Meg	Conv. Grid
R3	6.8Meg	½	N-4028	BTS-6.8Meg	AF Amp. Grid - See Note
R4A	330KΩ	½	*	BTS-330K	AF Amp. Plate
B	470KΩ	½		BTS-470K	Output Grid
R5	180Ω	½	N-4067	BTS-180	Output Cathode
R6	2200Ω	½	N-4896	BTS-2200	Filter - See Note
R7	68Ω	2	N-6014	BW-2-68	Filament Dropping - Wire Wound

* Items R4A, R4B, C6A, and C6B are combined into one unit.

Note Some models use Parallel Resistors in this application to obtain desired value

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		FIRESTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	1.9KΩ	2.9Ω	170Ω	.6Ω		A-3332 ①	A-3025 ①	R0-2 ①	① Bend mounting tabs down file out slot and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			FIRESTONE PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST113		
SP1	PM	2.9Ω	N-7824 ②	Model P4-X	4A07	② Includes output Trans.
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

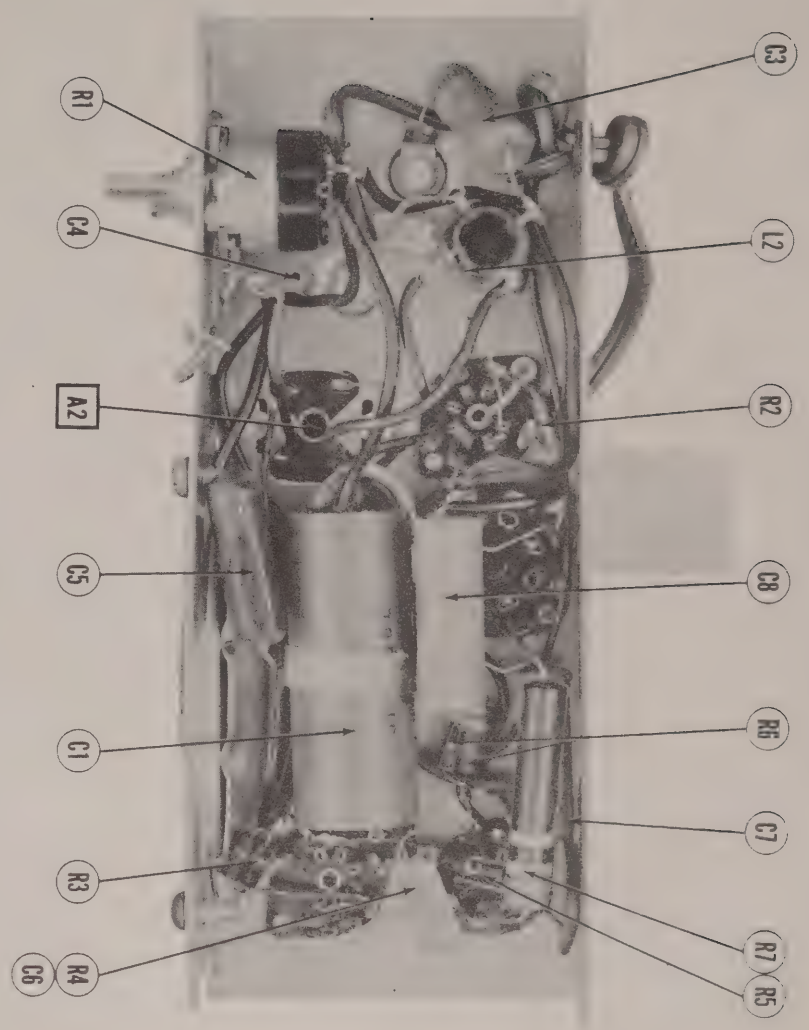
R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	FIRESTONE PART No.	MEISSNER PART No.	
L1	Loop Ant.	2.2Ω		N-7670		
L2	Osc. Coil	1.1Ω	7.6Ω	N-7725		Coupling Winding 2.7Ω
L3	IF Trans.	18Ω	23Ω	N-7694		

MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M1	2 Gang Var. Cap.	N-7141	(18-397MMF, 180-153MMF)
	Cabinet	#299	
	Knob	N-1270	Tuning
	Knob	N-7826	Volume

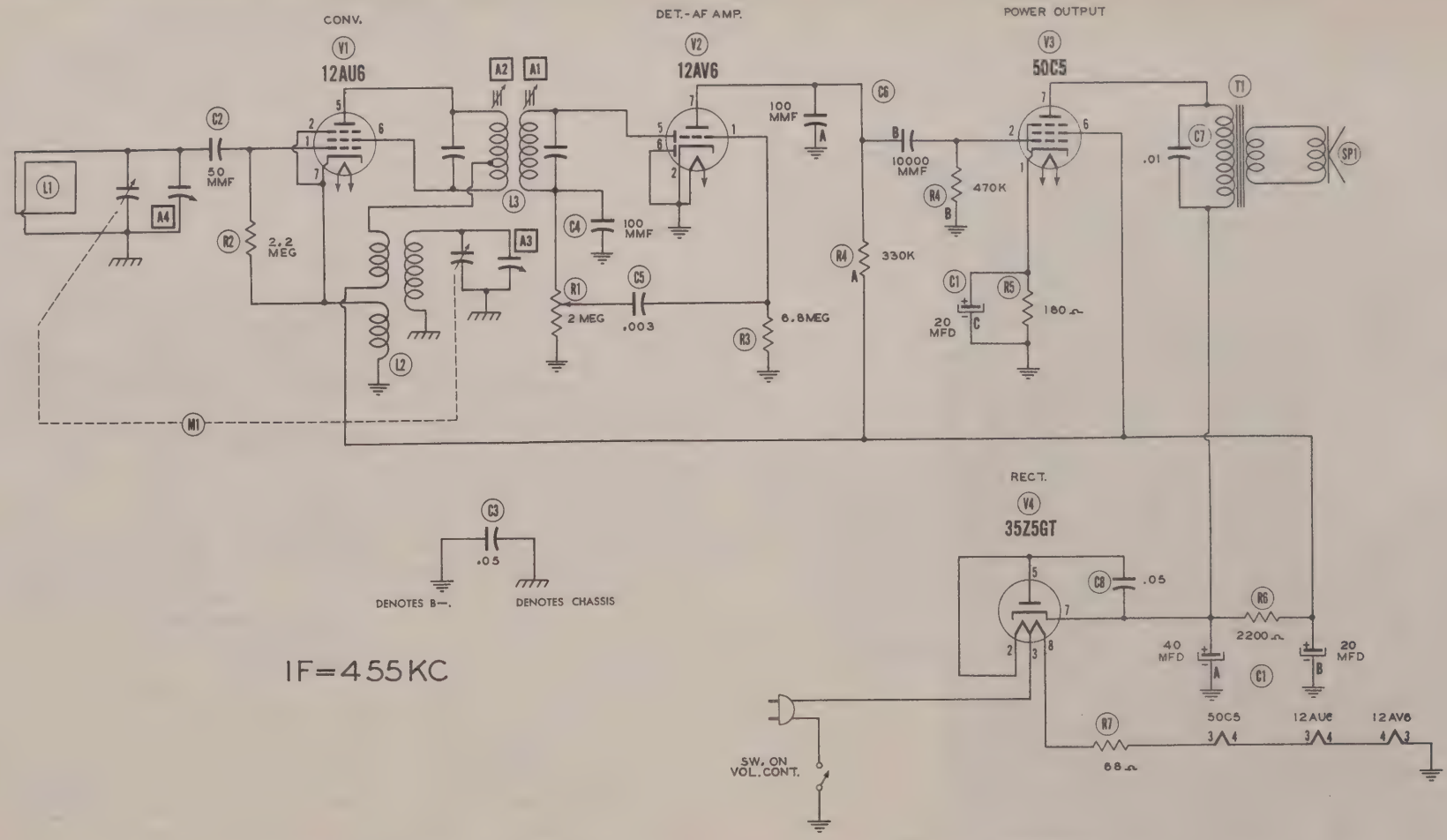
CHASSIS—BOTTOM VIEW



SET 136 FOLDER 8

FIRESTONE MODEL 4-A-70

FIRESTONE MODEL 4-A-70



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12AU6	§ -2.2VDC	0V	25VAC	12VAC	105VDC	105VDC	0V	
V 2	12AV6	-.9VDC	0V	0V	12VAC	-.4VDC	0V	80VDC	
V 3	50C5	8.8VDC	0V	75VAC	25VAC	0V	105VDC	108VDC	
V 4	35Z5GT	0V	108VAC	117VAC	0V	108VAC	0V	85VAC	110VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12AU6	2.2Meg	1.1Ω	26Ω	13Ω	†2.2KΩ	†2.2KΩ	1.1Ω	
V 2	12AV6	6.8Meg	0Ω	0Ω	13Ω	2Meg	0Ω	†330KΩ	
V 3	50C5	180Ω	470KΩ	75Ω	26Ω	470KΩ	†2.2KΩ	†170Ω	
V 4	35Z5GT	Inf.	180Ω	175Ω	Inf.	180Ω	Inf.	145Ω	50KΩ

† MEASURED FROM PIN 8 OF V4

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

HALLICRAFTERS
MODELS 805, 806, 810

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MODEL 806

HALLICRAFTERS
MODELS 805, 806, 810

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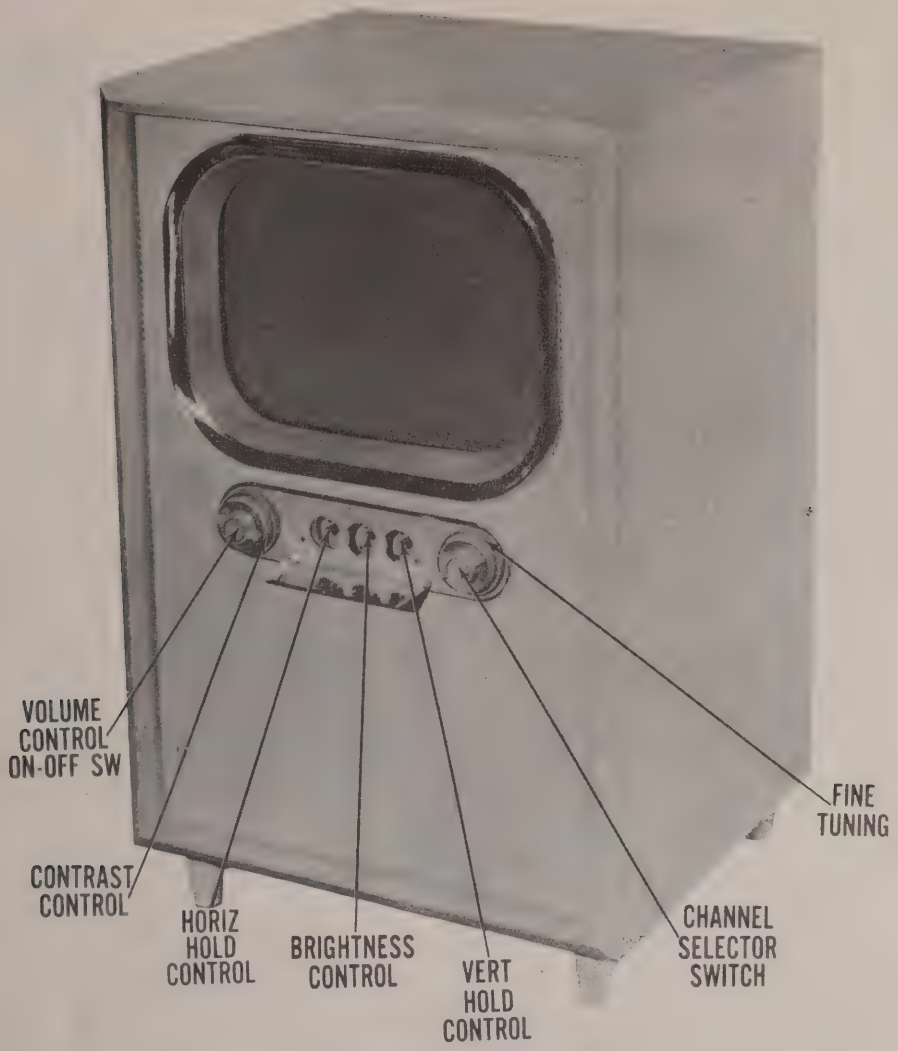
DATE 6-51 SET 136 FOLDER 9



HALLICRAFTERS
MODELS 805, 806, 810

HALLICRAFTERS MODEL 806

TRADE NAME	Hallicrafters, Models 805, 806, 810
MANUFACTURER	The Hallicrafters Co., 4401 W. 5th Ave., Chicago (24), Illinois
TYPE SET	Television Receiver
TUBES	Sixteen
POWER SUPPLY	110-120 Volts AC - 60 Cycle — RATING 1.2 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13

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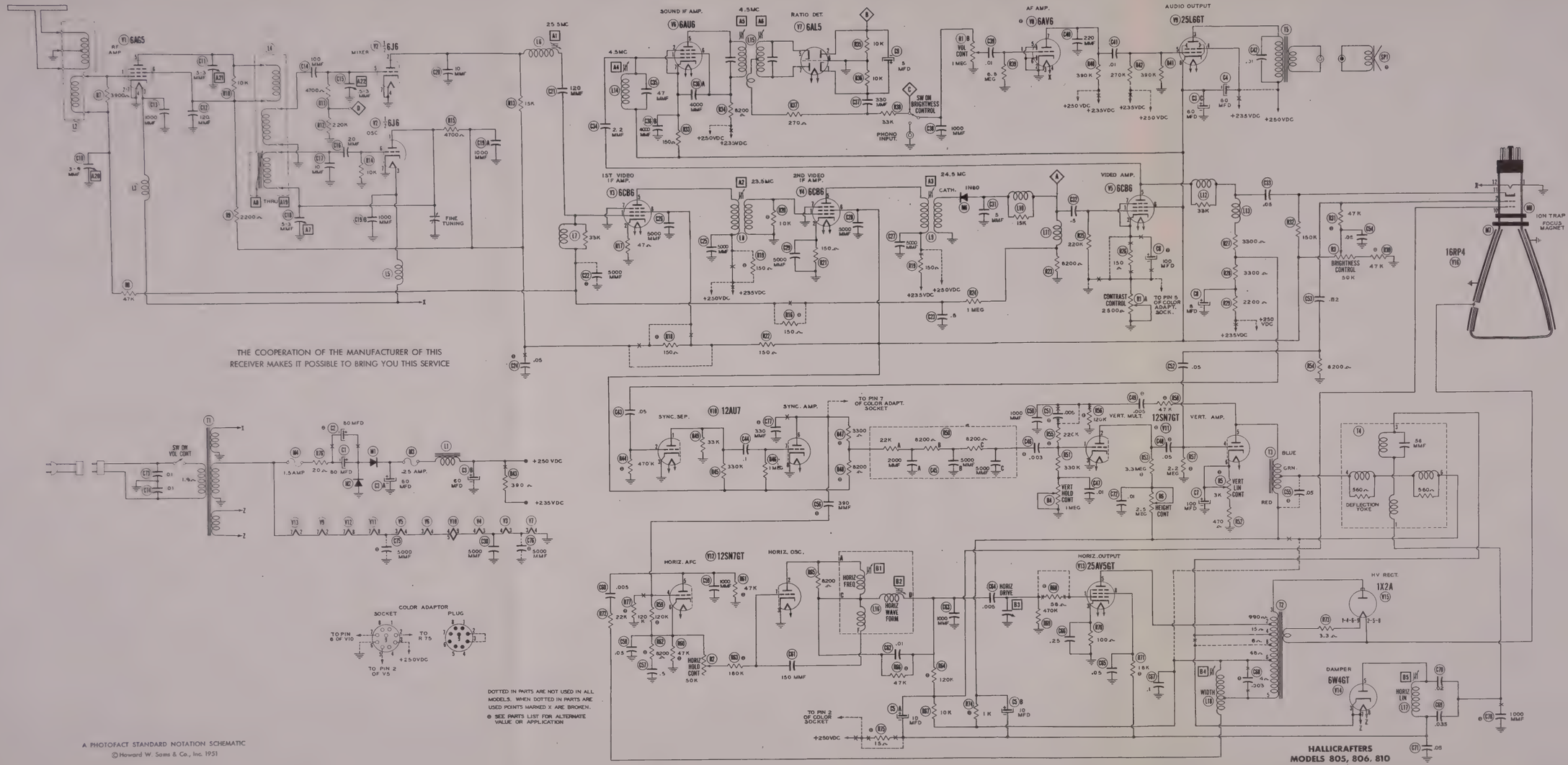
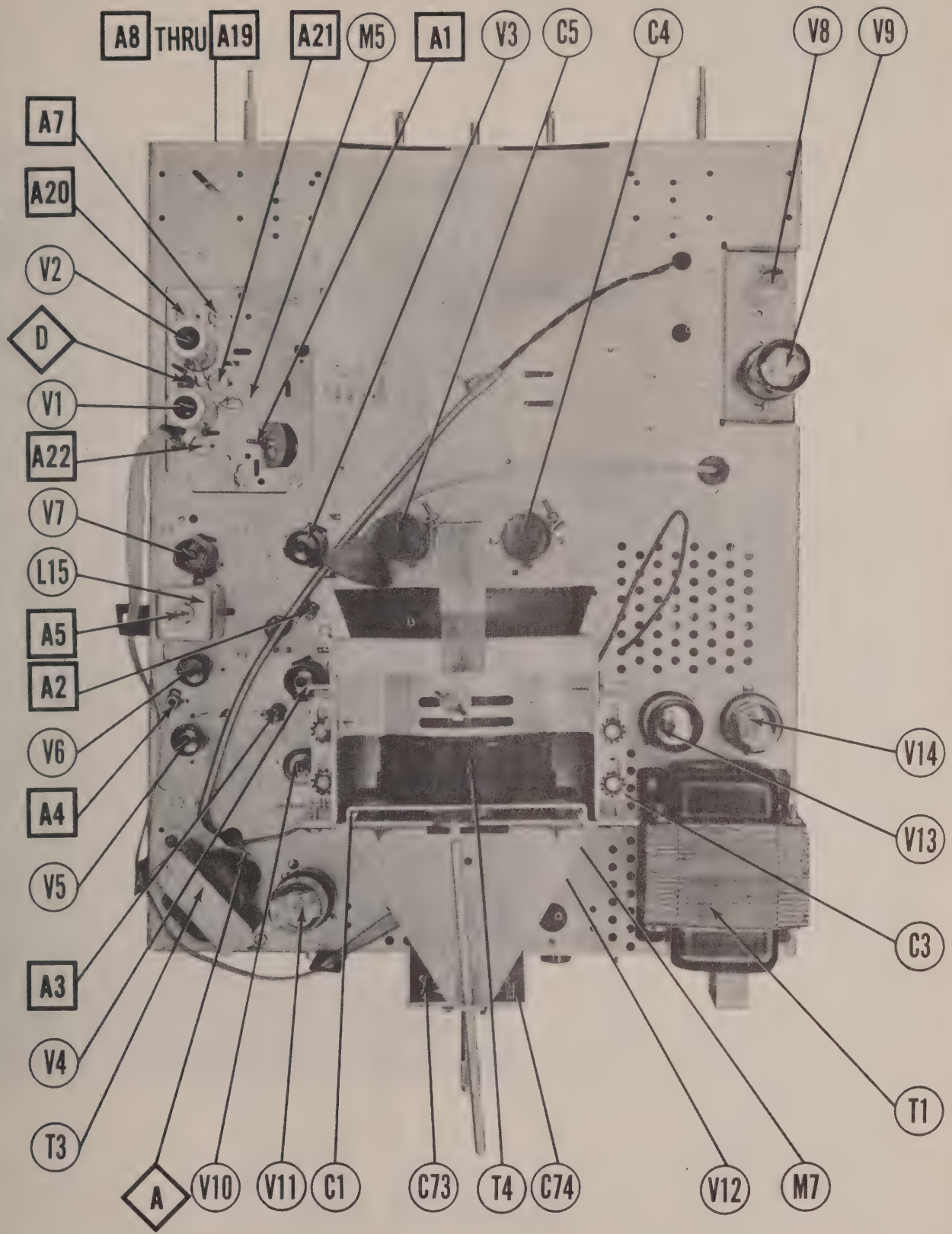
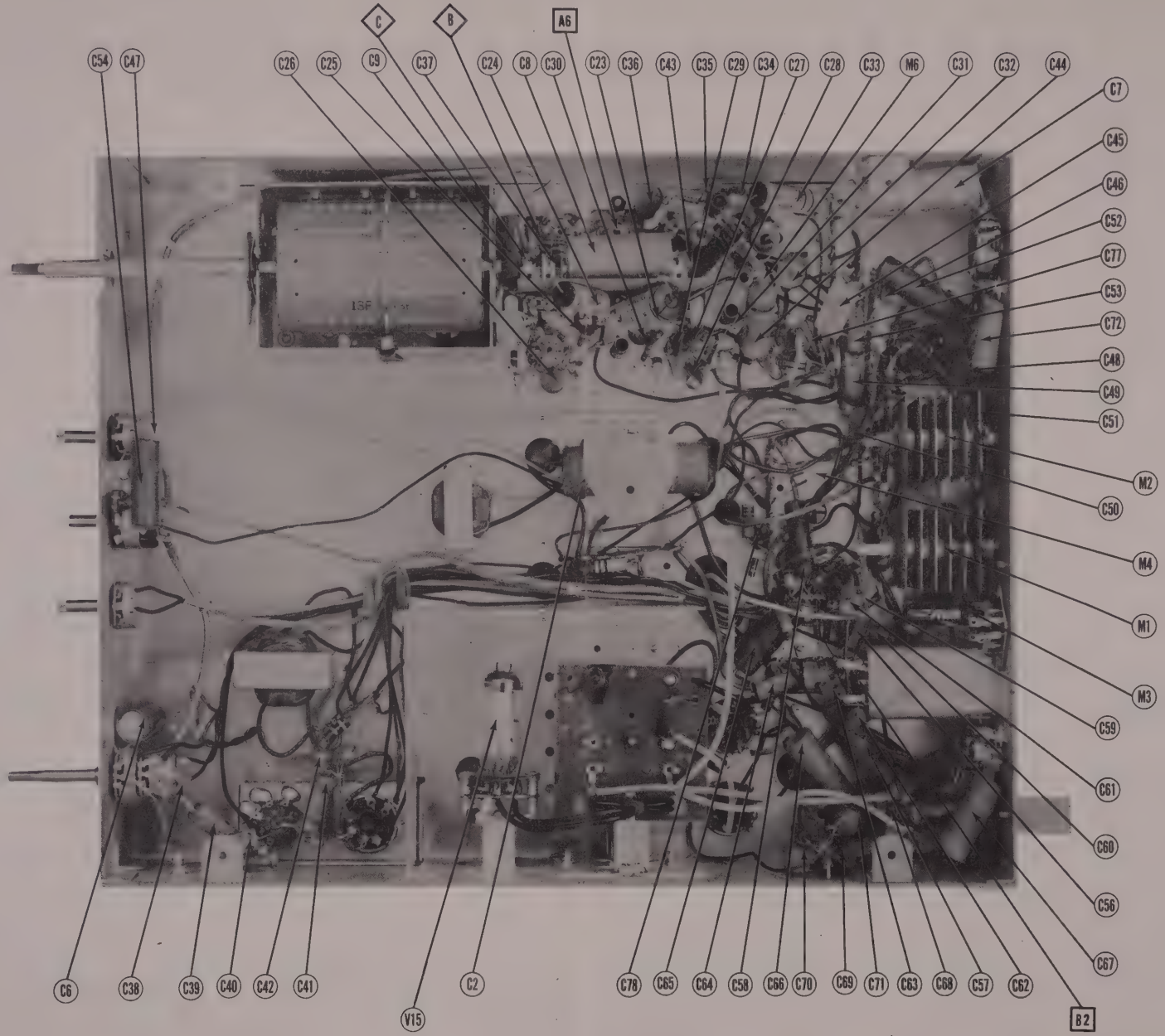


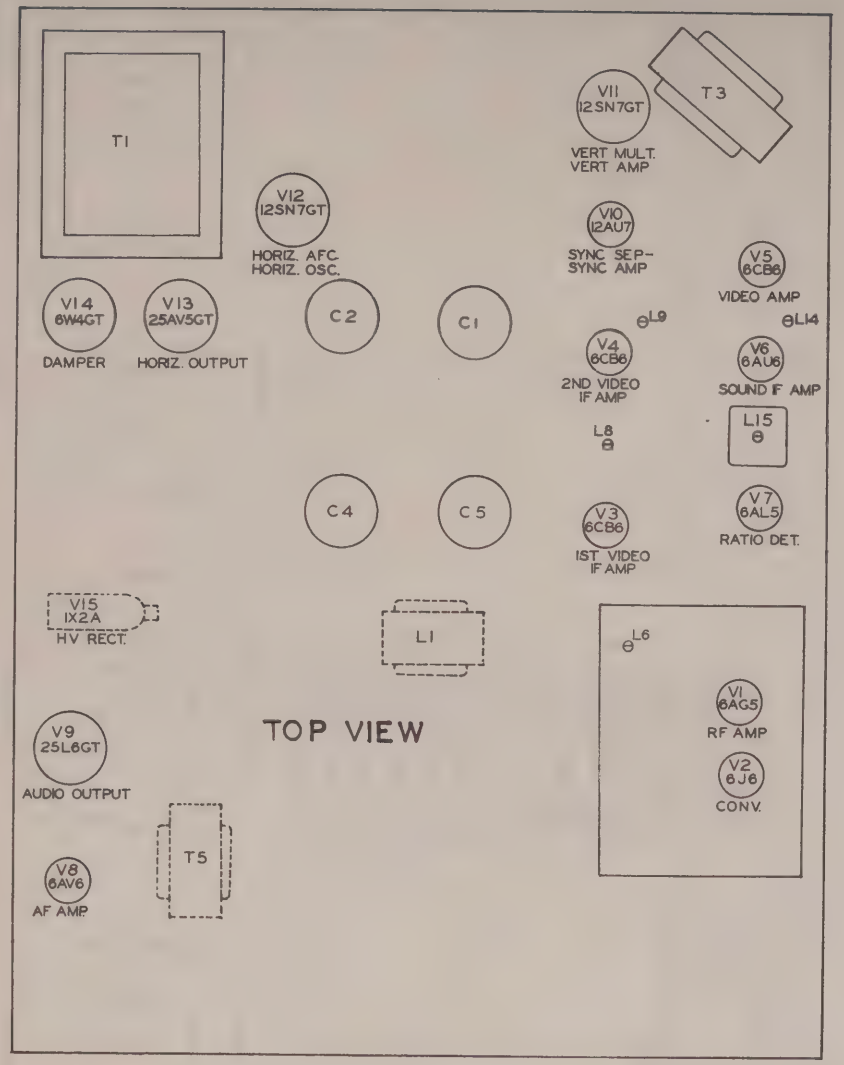
HALLICRAFTERS
MODELS 805, 806, 810

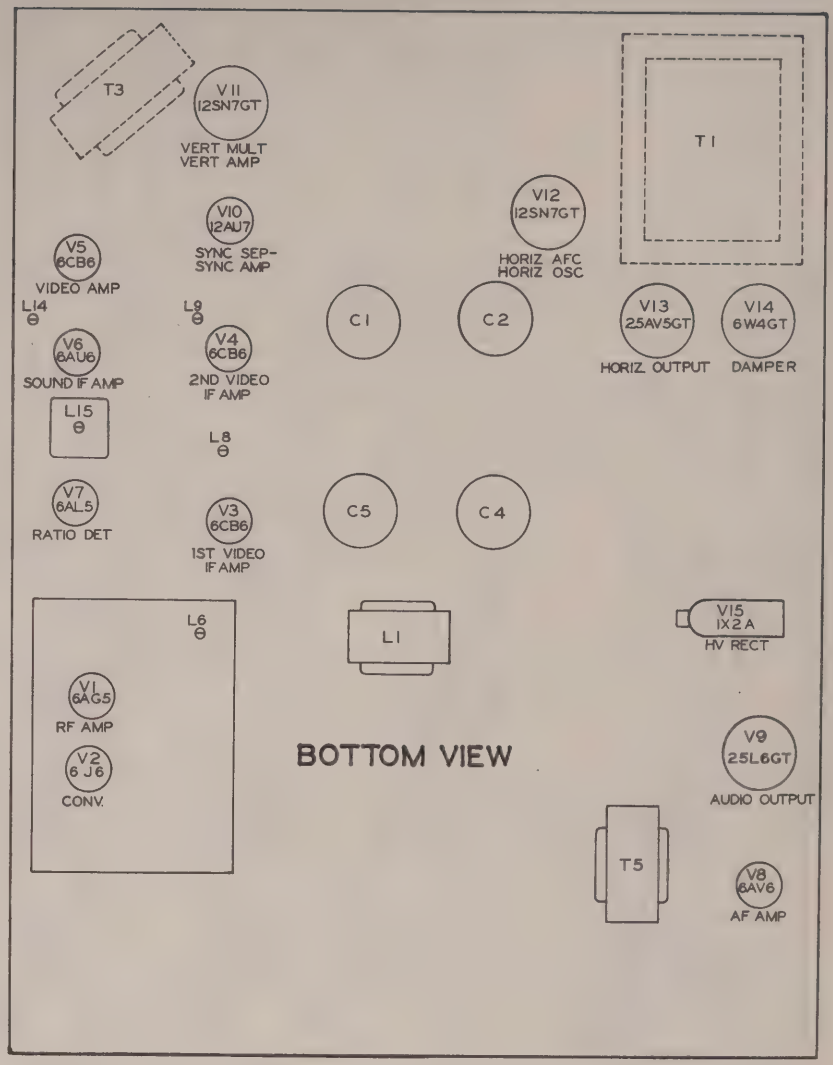


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW - CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

MODELS 805, 806, 810

HALLICRAFTERS

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube, (V2), and replace it with a 6J6 which has Pin 1 removed. This will disable the local oscillator and prevent the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	25.5MC (Unmod.)	Any	DC probe to Point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	23.5MC	"	"	A2	"
3.	"	"	24.5MC	"	"	A3	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	24MC (10MC SWP)	21.25MC 25.75MC	Any	Vert. amp. to Point (A). Low side to chassis.		Check for response curve similar to figure 1. If necessary retouch A1, A2 and A3 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.01MFD	High side to Pin 1 (grid) of 6CB6 (V5). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to Point (B). Common to chassis.	A4, A5	Adjust for maximum deflection.
6.	"	"	"	"	DC probe to Point (C). Common to chassis.	A6	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.01MFD	High side to Pin 1 (grid) of 6CB6, (V5). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. amp. to Point (B). Low side to chassis.	A4, A5	Disconnect stabilizer capacitor C9. Adjust for maximum amplitude and symmetry as per figure 2.
6.	"	"	"	"	"	Vert. amp. to Point (C). Low side to chassis.	A6	Reconnect capacitor C9. Adjust A6 so 4.5MC occurs at center of crossover lines as per figure 3. SLIGHTLY retouch A5 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.

Complete oscillator alignment may not be necessary. If the oscillator seems to be off-frequency approximately the same amount for a majority if the channels it may be possible to correct them in one step using A7. It should be noted that this is an all-channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A7 will not bring all channels within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment for each channel that is off-frequency. The channel strip adjustment are reached through a hole just to the right of the channel switch shaft. The correct adjustment is accessible through the hole as the channel switch is turned to each channel.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. amp. to Point (A). Low side to chassis.	A8	Adjust to place sound marker as shown in figure 4. The video marker should be at 50%.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A9	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A10	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A11	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A12	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A13	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A14	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A15	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A16	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A17	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A18	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A19	

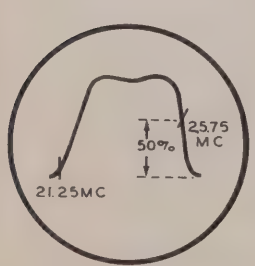


FIG. 1

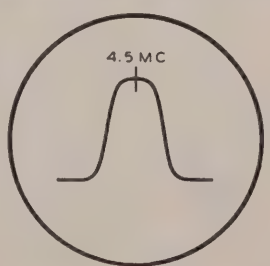


FIG. 2

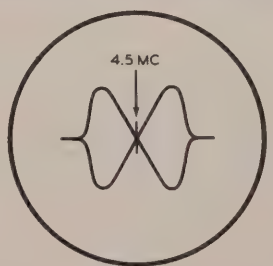


FIG. 3

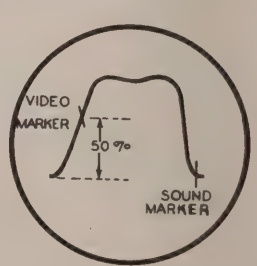


FIG. 4

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 204.75MC	12	Vert. amp. thru 10KΩ to Point ◇. Low side to chassis.	A20, A21, A22	Adjust for response curve similar to figure 5 with markers above 90%.
9.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check all channels for response similar to figure 5. If markers fall below 70% on any channel, make slight adjustment of A20, A21 and A22 with channel switch set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

FIG.5

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.6VDC	0V	6.3VAC	0V	105VDC	105VDC	0V		
V 2	6J6	82VDC	85VDC	6.3VAC	0V	-2.3VDC	§-5.2VDC	0V		
V 3	6CB6	-.3VDC	.6VDC	6.3VAC	13VAC	230VDC	140VDC	0V		
V 4	6CB6	0V	1VDC	13VAC	20VAC	230VDC	140VDC	0V		
V 5	6CB6	3.5VDC	30VDC	43VAC	36VAC	150VDC	140VDC	30VDC		
V 6	6AU6	▲0V	▲.6VDC	36VAC	28VAC	▲50VDC	▲50VDC	▲.6VDC		
V 7	6AL5	.6VDC	-.7VDC	6.3VAC	0V	-.3VDC	0V	.1VDC		
V 8	6AV6	-.4VDC	0V	0V	6.3VAC	0V	0V	70VDC		
V 9	25L6GT	0V	65VAC	▲85VDC	▲80VDC	▲-5VDC	0V	93VAC	145VDC	
V 10	12AU7	7VDC	-.4VDC	0V	28VAC	28VAC	55VDC	.4VDC	0V	20VAC
V 11	12SN7GT	-6VDC -11VDC	60VDC 95VDC	0V	0V	400VDC 415VDC	6VDC 25VDC	55VAC	43VAC	
V 12	12SN7GT	-40VDC -45VDC	200VDC	0V	-4VDC	-12VDC	-4VDC	65VAC	55VAC	
V 13	25AV5GT	-22VDC	93VAC	8VDC	0V	*	0V	117VAC	140VDC	
V 14	6W4GT	0V	0V	425VDC	0V	245VDC	0V	425VDC	425VDC	
V 15	1X2A	* DO NOT MEASURE								
V 16	16RP4	0V	PIN 2 55VDC 135VDC	PIN 10 415VDC	PIN 11 135VDC	PIN 12 6.3VAC				

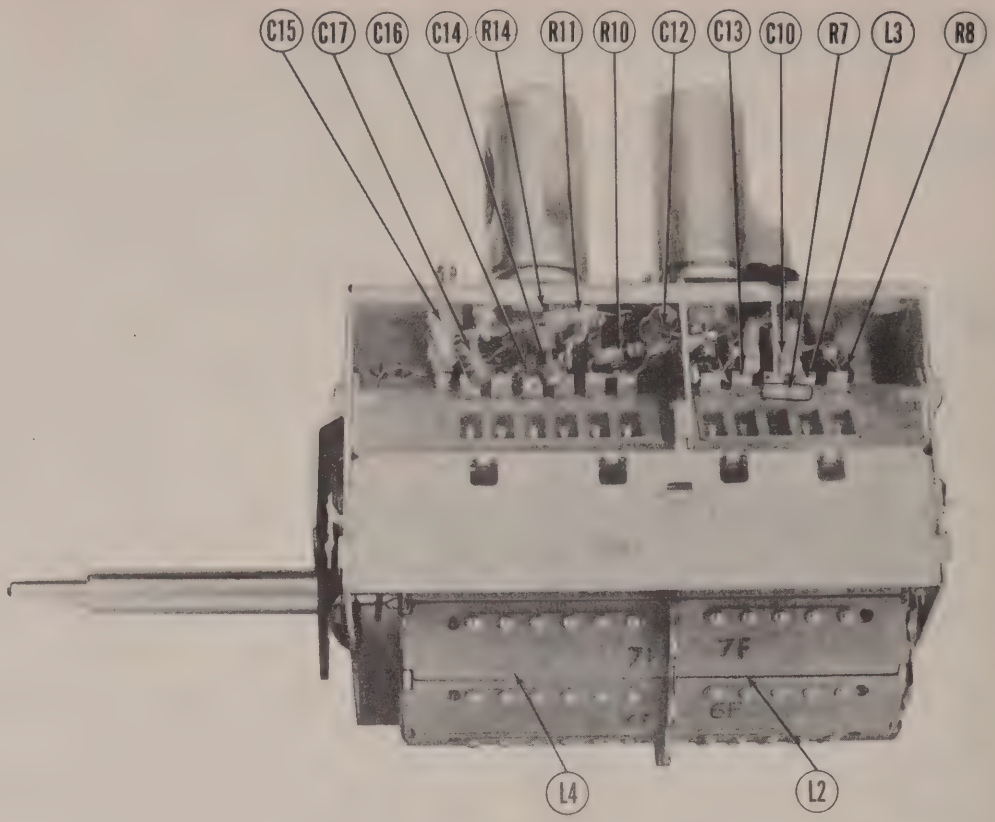
ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
* DO NOT MEASURE
§ TAKEN WITH VACUUM TUBE VOLTMETER
▲ MEASURED FROM PIN 8 OF V9

RESISTANCE READINGS

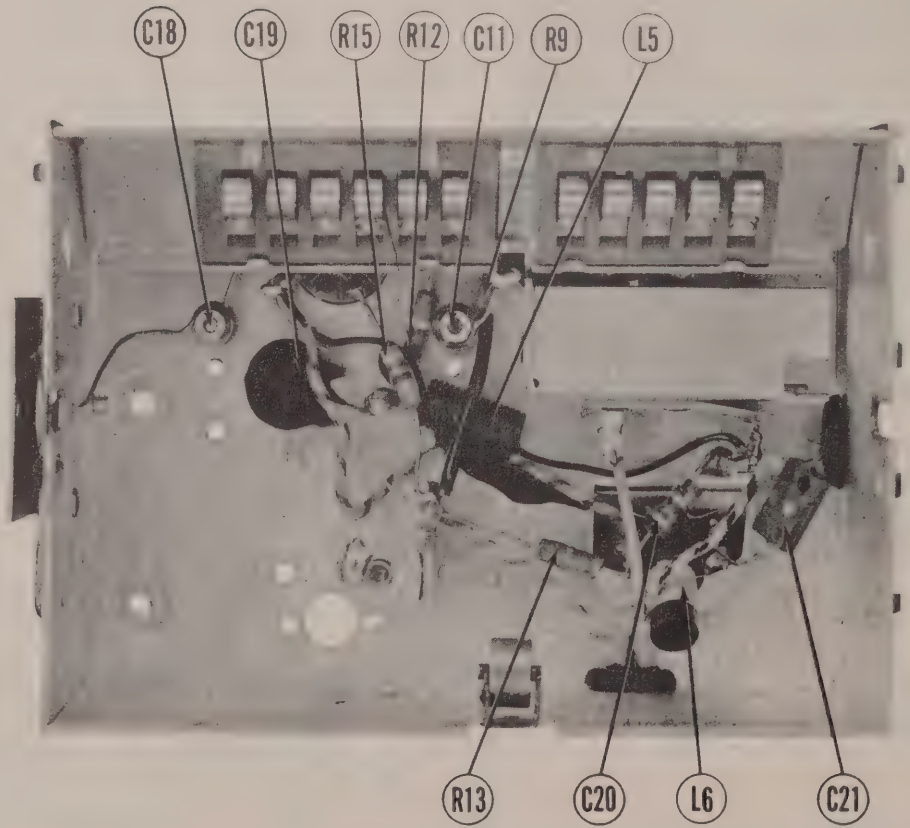
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	1Meg	0Ω	.1Ω	0Ω	▲2.3KΩ	▲2.3KΩ	0Ω		
V 2	6J6	▲5KΩ	▲15KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6CB6	1Meg	47Ω	3Ω	5Ω	†500Ω	▲150Ω	0Ω		
V 4	6CB6	0Ω	150Ω	5Ω	8Ω	†650Ω	▲0Ω	0Ω		
V 5	6CB6	220KΩ	2500Ω	14Ω	12Ω	†10KΩ	▲0Ω	2500Ω		
V 6	6AU6	▲1Ω	▲150Ω	12Ω	10Ω	†10KΩ	†10KΩ	▲150Ω		
V 7	6AL5	10KΩ	10KΩ	3Ω	0Ω	1Meg	0Ω	1Meg		
V 8	6AV6	6.8Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	†400KΩ		
V 9	25L6GT	Inf.	15Ω	†400Ω	†450Ω	170KΩ	Inf.	11Ω		
V 10	12AU7	▲70KΩ	500KΩ	0Ω	10Ω	10Ω	▲12KΩ	1.1Meg	0Ω	8Ω
V 11	12SN7GT	350KΩ 1.5Meg	#4Meg #6Meg	0Ω	2Meg	#2KΩ	500 Ω 3.5KΩ	15Ω	14Ω	
V 12	12SN7GT	220KΩ 270KΩ	#130KΩ	0Ω	75KΩ	50KΩ	50KΩ	15Ω	15Ω	
V 13	25AV5GT	500KΩ	11Ω	100Ω	Inf.	#20Ω	Inf.	3Ω	†20KΩ	
V 14	6W4GT	Inf.	Inf.	150KΩ	Inf.	†150Ω	Inf.	#0Ω	#.1Ω	
V 15	1X2A	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Top Cap #1100Ω
V 16	16RP4	0Ω	PIN 2 100KΩ	PIN 10 #10KΩ	PIN 11 200K	PIN 12 .1Ω				

ALL MEASUREMENTS TAKEN WITH PICUTRE TUBE REMOVED
† MEASURED FROM OUTPUT OF M1
▲ MEASURED FROM PIN 8 OF V9
MEASURED FROM PIN 3 OF V14

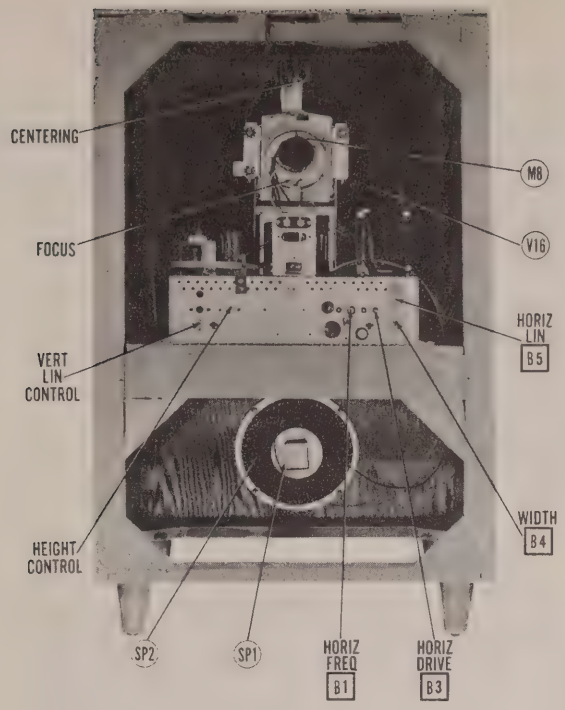
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a short across terminals C and D of L16.

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug, (B1), until the picture synchronizes horizontally.

Remove the short from L16 and connect the vertical input of an oscilloscope to terminal C.

Adjust the waveform slug, (B2), until the broad and narrow peaks of the waveform on the oscilloscope are of equal height as shown in figure 6. If necessary adjust B1 to keep the picture synchronized. The picture should remain in sync over at least 3/4 of the hold control rotation.

Adjust the horizontal drive trimmer clockwise until crowding, or bright vertical line appears in the picture.

The turn B3 slightly counter-clockwise just far enough to remove the line or crowding.

Adjust the width slug, (B4), until the picture fills the mask horizontally.

Adjust the horizontal linearity slug, (B5), until the picture is symmetrical from left to right. Slight readjustment of B3 may be required for optimum linearity.

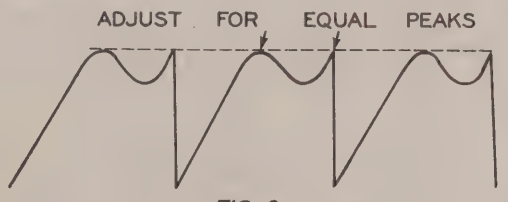


FIG. 6

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove six wood screws from rear cover. Remove rear cover.
3. Disconnect built-in antenna.
4. Disconnect speaker.
5. Remove five metal screws from chassis. Remove chassis.
6. Remove four hex nuts from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL, IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: HALLICRAFTER PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	90X6AG5	6AG5	7BD	
V2	Converter	90X6J6	6J6	7BF	
V3	1st. Video IF Amp.	90X6CB6	6CB6	6CK	
V4	2nd. Video IF Amp	90X6CB6	6CB6	6CK	
V5	Video Amplifier	90X6CB6	6CB6	6CK	
V6	Sound IF Amp.	90X6AU6	6AU6	7BK	
V7	Ratio Detector	90X6AL5	6AL5	6BT	
V8A	AF Amplifier	90X6AV6	6AV6	5BT	
B	AF Amplifier	90X68Q7	68Q7	8Q	
V9	Audio Output	90X25L6GT	25L6GT	7AC	
V10	Sync. Separator-Sync. Amplifier	90X12AU7	12AU7	9A	
V11A	Vertical Mult.-Vert. Amplifier	90X12SN7GT	12SN7GT	8BD	
B	Vertical Mult.-Vert. Amplifier	90X12AH7	12AH7	9A	
V12	Horiz. AFC-Horiz. Oscillator	90X12SN7GT	12SN7GT	8BD	
V13	Horiz. Output	90X25AV5GT	25AV5GT		
V14	Damper	90X6W4GT	6W4GT	4CG	
V15	HV Rectifier	90X1X2A	1X2A	7CM	
V16	Picture Tube	90X16RP4	16RP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: HALLICRAFTER PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	80	150	45B178-B	PRS150/100		UPE8015		TVA-1418	Voltage Doubler Cap.
C2	80	150	45B178-B						Voltage Doubler Cap. *
C3A	60	300	45B179	AFH284H			R1079		Filter Yellow
B	60	300		PRS450/40-20					Filter Red
C	60	300							Filter Red
C4	60	150	45B180-C	PRS150/50		BR6015		TVL-1420	Decoupling
C5A	10	450	45B182-C	PRS450/10-10		UPT1145		TVL-2750	Decoupling Red
B	10	450							Decoupling Red
C6	100	6		PRS6/100		BRH60l		TVA-1101	V. Amp. Cathode *
C7	100	50	45A105	PRS50/100		BRH50l		TVA-1310	Vert. Output Cathode
C8	8	350	45B184	PRS350/8		BR835A		TVA-1603	V. Amp. Decoupling
C9	5	50	45B175	PRS150/4		BR550		TVA-1303	Stablizing Cap.
C10	3-9				829-3				Variable Trimmer
C11	.5-3				829-3				Variable Trimmer
C12	120			SI120	D6-121		GP2K-121	19C29	RF Amp. Decoupling
C13	1000			BPD-001	DD-102		801-001	19C1	RF Amp. Fil.
C14	100			SI100N750	TCN-100		N750L-101	19C16	RF Coupling
C15	.5-3				829-3				Variable Trimmer
C16	20			SI20NP0	TCZ-20		NP0K-200		Osc. Grid Cap.
C17	10			SI10N750	TCN-10		N750K-100	19C4	Fixed Trimmer
C18	.5-3				829-3				Variable Trimmer
C19A	1000			BPD-2X001	DD-2-102		822-001	39C7	RF Bypass
B	1000								Conv. Filament
C20	10			SI10NP0	TCZ-10		NP0K-100	19C3	Fixed Trimmer
C21	120	500		SI120	D6-121		GP2K-121	19C29	IF Coupling
C22	5000		45A168	BPD-005	DD-502	ID5D5	81l-005	29C1	AGC Filter *
C23	.5	50	46A177	P288-5		GT2P5		2TM-P5	AGC Filter
C24	.05	600	46AY503J	DF-503		PTE6S5		6TM-S5	RF Bypass *
C25	5000		45A168	BPD-005	DD-502	ID5D5	81l-005	29C1	lst. V. IF Plate Dec.
C26	5000		45A168	BPD-005	DD-502	ID5D5	81l-005	29C1	lst. V. IF Screen
C27	5000		45A168	BPD-005	DD-502	ID5D5	81l-005	29C1	lst. V. IF Plate Dec.
C28	5000		45A168	BPD-005	DD-502	ID5D5	81l-005	29C1	2nd. V. IF Screen
C29	5000		45A168	BPD-005	DD-502	ID5D5	81l-005	29C1	2nd. V. IF Cathode
C30	5000		45A168	BPD-005	DD-502	ID5D5	81l-005	29C1	2nd. V. IF Fil.
C31	5		45B20050K5	SI5	TCZ-4.7	5W5V5	GP1K-050	MS-5C	V. Diode Filter
C32	.5	25	46A177	P288-5		GT2P5		2TM-P5	Video Coupling
C33	.05	600	46AY503J	P688-05	DF-503	PTE6S5		6TM-S5	Video Coupling
C34	2.2		45A160-4		TCZ-2.2				S. IF Coupling
C35	47			SI47N750	TCN-47		NP0-333-47	19C9	Fixed Trimmer
C36A	4000		47A218	BPD-2X004	DD-2-502	ID5D4	822-004	36C2	S. IF Dec.
B	4000					ID5D4			S. IF Cathode
C37	330		47B20331K5	SI330	D6-331	5W5T3	GP2K-331	19C14	Diode Load Cap.
C38	1000		47B20A102M5	SI1000	D6-102	1W5D1	GP2L-102	19C1	De-emphasis
C39	.01	200	46AU103J	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C40	220	500	47X20B221K	SI220	D6-221	5W5T25	GP2K-221	19C13	AF Amp. Plate
C41	.01	600	46AY103J	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Audio Coupling
C42	.01	600	46AY103J	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Output Plate
C43	.05	600	46AY503J	P688-05	DF-503	PTE6S5		6TM-S5	Sync. Coupling
C44	.1	400	46AU104J	P488-1	DF-104	PTE4P1		4TM-P1	Sync. Coupling
C45A	2000			P688-002	†	PTE6D2	GP2-333-202	6TM-D2	Integrator Net
B	5000			P688-005	PC-100	PTE6D5	GP2-333-502	6TM-D5	Integrator Net
C	5000			P688-005		PTE6D5	GP2-333-502	6TM-D5	Integrator Net
C46	.003	600		P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	Vert. Osc. Grid ¶
C47	.01	600	46AY103J	P688-01	D6-103	PTE6S1		6TM-S1	Vert. Osc. Grid
C48	.05	600	46AY503J	P688-05	DF-503	PTE6S5		6TM-S5	Vert. MV Feedback ‡
C49	.005	600	46AY502J	P688-005	D6-502	PTE6D5	81l-005	6TM-D5	Vert. Shaping §
C50	1000	800	47A227	1464-HV-001					Vert. Shaping
C51	.005	600	46AY502J	P688-005	D6-502	PTE6D5	81l-005	6TM-D5	Vert. Shaping *
C52	.05	600	46AY503J	P688-05		PTE6S5		6TM-S5	Vert. Discharge
C53	.02	600	46AY203J	P688-02	DF-203	PTE6S2		6TM-S2	Vert. Sweep Coupling
C54	.05	600	46AY503J	P688-05	DF-503	PTE6S5		6TM-S5	Pic. Tube Grid Dec.
V55	.05	500	46AY503J	P688-05	DF-503	PTE6S5		6TM-S5	Fixed Trimmer *
C56	390	500	47B20A471M5	1468-0004	D6-391	5W5T4	GP2K-391	1FM-34	Hor. Sync. Coupling #
C57	.5	200	46AT504J	P288-5				2TM-P5	AFC Filter
C58	.05	200	46AU503J	P288-05	DF-503	PTE4S5		2TM-S5	AFC Filter
C59	1000		47B20A102M5	SI1000	D6-102	1W5D1	GP2L-102	19C1	Hor. AFC Plate
C60	.005	600	46AY502J	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Hor. Feedback
C61	150	500	47X20B121K	1468-00015	D6-151	5W5T15	GP2K-151	1FM-315	Hor. Osc. Grid
R62	.01	400	46BR103E4	P488-01		PTE6S1		4TM-S1	Fixed Trimmer
C63	1000	500	47X20B102K	1468-001	D6-102	1W5D1	GP2L-102	1FM-21	Hor. Discharge
C64	.005	600	46AY502J	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Hor. Sweep Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Hallicrafters Part No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C85	.05	600	46AY503J	P688-05	DF-503	PTE6S5		6TM-S5	Hor. Output Screen
C66	.25	200	46AT254J	P488-25		GT2P25		2TM-P25	Hor. Output Cathode
C67	.1	600	46AY104J	P688-1	DF-104	PTE6P1		6TM-P1	Fixed Trimmer
C68	.003	600		P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	Fixed Trimmer *
C69	.035	600	46AY353J	P688-033					Damper Filter
C70	.02	600	46AY203J	P688-02		PTE6S2		6TM-S2	Damper Filter
C71	.05	600	46AY503J	P688-05	DF-503	PTE6S5		6TM-S5	Decoupling *
C72	.01	600	46AY103J	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Vert. MV Decoupling
C73	.01	600	46BR103L6	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Line Filter
C74	.01	600	64BR103L6	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Line Filter
C75	5000		45A168	BPD-005	DD-502	ID5D5	81l-005	29C1	Filament Bypass *
C76	5000		45A168	BPD-005	DD-502	ID5D5	81l-005	29C1	Filament Bypass *
C77	330		47B20331K5	SI330	D6-331	5W5T3	GP2K-331	19C14	Sync. Amp. Plate *
C78	1000		47B20A102M5	SI1000	D6-102	1W5D1	GP2L-102	19C1	Damper Filter *

* Not used in all models.
† Items C45A, C45B, C45C, R50A R50B, and R50C are combined into one unit.
‡ Some models use .02MFD in this application.
§ Some models use 1000 MMF in this application.
¶ Some models use 470MMF in this application.
# Some models use .001 MFD in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: HALLICRAFTER PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	2500Ω	½	25B902	Concentrikit B11-112 ϕ; B13-137 ϕ; E-102 ϕ; 76-1 ϕ	RTV-266	SBB-673-S	Contrast control - Front
B	1Meg	½					Volume Control - Rear
C	Shaft end						Attach per instructions in "Concentrikit"
D	Switch						Attach per instructions in "Concentrikit"
R2A	50KΩ	½	25A901	Q11-123	AG-44-S	AN-31	Horiz. Hold Control
B	Shaft		Not req.	Not req.	KSS-3	AK-4	Attach to R2A per instructions
R3A	50KΩ	½	25A915		AM-44-S	AN-31	Brightness Control
B	Shaft		Not req.		FKS-1/4	AK-1	Attach to R3A per instructions
C	Switch		Not req.		SW-A1	K-156	Attach to R3A per instructions
R4A	1Meg	½	25A900	Q11-137	AG-61-S	AN-69	Vert. Hold Control
B	Shaft		Not req.	Not req.	KSS-3	AK-4	Attach to R4A per instructions
R5A	3000Ω	½	25B899	Q11-112	AM-15-S	B-8	Vert. Linearity Control - See Note 1
B	Shaft		Not req.	Not req.	FKS-1/4	Not req.	Attach to R5A per instructions
R6A	2.5Meg	½	25B711	Q11-239	AG-84-S	AN-83	Height Control
B	Shaft		Not req.	Not req.	FKS-1/4	AK-1	Attach to R6A per instructions

ϕ Additional parts to be used with "Concentrikit"
Note 1 Some models use 2500Ω Control in this application.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Hallicrafters PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UN LESS OTHERWISE SPECIFIED
R7	3900Ω	½		BTS-3900	Antenna Coil Shunt
R8	47KΩ 20%	½		BTS-47K	AGC Network
R9	2200Ω 20%	½		BTS-2200	RF Amp. Decoupling
R10	10KΩ 20%	½		BTS-10K	RF Coil Shunt
R11	4700Ω 20%	½		BTS-4700	Mixer Grid
R12	220KΩ 20%	½		BTS-220K	Mixer Grid
R13	15KΩ 20%	½		BTS-15K	Mixer Plate
R14	10KΩ	½		BTS-10K	Osc. Grid
R15	4700Ω	½		BTS-4700	Osc. Plate
R16	150Ω	½	23X20X151K	BTS-150	AGC Network - See Note 2
R17	47Ω	½	23X20X470K		lst. Video IF Amp. Cathode
R18	150Ω	½	23X20X151K	BTS-150	Decoupling - See Note 3
R19	150Ω	½	23X20X151K	BTS-150	2nd. Video IF Amp. Plate Decoupling - See Note 4
R20	10KΩ	½	23X20X103K	BTS-10K	2nd. Video IF Transformer Shunt - See Note 5
R21	150Ω	½	23X20X151K	BTS-150	2nd. Video IF Amp. Cathode
R22	150Ω	½	23X20X151K	BTS-150	Decoupling
R23	8200Ω	½	23X20X822K	BTS-8200	Video Det. Diode Load
R24	1Meg 20%	½	23X20X105M	BTS-1Meg	AGC Network
R25	220KΩ	½	23X20X224K	BTS-220K	Video Amp. Grid
R26	150Ω	½	23X20X151K	BTS-150	Video Amp. Cathode
R27	3300Ω	1	23X30X332K	BTA-3300	Vidoe Amp. Plate
R28	3300Ω	1	23X30X332K	BTA-3300	Video Amp. Plate
R29	2200Ω 20%	1	23X30X222M	BTA-2200	Video Amp. Plate Decoupling
R30	47KΩ	½	23X20X473K	BTS-47K	Voltage Divider - See Note 17
R31	47KΩ	½	23X20X473K	BTS-47K	Picture Tube Grid - See Note 6
R32	150KΩ	½	23X20X154K	BTS-150K	Picture Tube Cathode
R33	150Ω	½	23X20X151K	BTS-150	Sound IF Amp. Cathode
R34	8200Ω	½	23X20X822K	BTS-8200	Sound IF Amp. Decoupling
R35	10KΩ	½	22X20X103K	BTS-10K	Ratio Det. Diode Load
R36	10KΩ	½	22X20X103K	BTS-10K	Ratio Det. Diode Load
R37	270Ω	½	23X20X271M	BTS-270	Balancing
R38	33KΩ	½	23X20X333K	BTS-33K	De-emphasis
R39	6.8Meg	½	23X20X685M	BTS-6.8Meg	AF Amp. Grid
R40	390KΩ	½	23X20X394J	BTS-390K	AF Amp. Plate
R41	390KΩ 5%	½	23X20X394J	BTS-390K-5%	Output Grid
R42	270KΩ	½	23X20X274J	BTS-270Z	Bias Network
R43	390Ω	1	23X30X391K	BTA-390	Decoupling
R44	470KΩ 20%	½	23X20X474M	BTS-470K	Sync. Amp. Grid - See Note 7
R45	330KΩ	½	23X20X334K	BTS-330K	Sync. Amp. Plate - See Note 8
R46	1Meg 20%	½	23X20X105M	BTS-1Meg	Sync. Sep. Grid
R47	3300Ω	½	23X20X332K	BTS-3300	Sync. Sep. Plate - See Note 9
R48	8200Ω	½	23X20X822K	BTS-8200	Sync. Sep. Plate - See Note 10
R49	33KΩ	½	23X20X333K	BTS-33K	Voltage Divider
R50A	22KΩ	½	49B015 †	BTS-22K	Integrator
B	8200Ω			BTS-8200	Integrator
C	8200Ω			BTS-8200	Integrator
R51	330KΩ 20%	½	23X20X334M	BTS-330K	Vert. MV Grid
R52	470Ω 20%	½	23X20X471M	BTS-470	Vert. MV Cathode
R53	3.3Meg	½	23X20X335K	BTS-3.3Meg	Vert. MV Plate - See Note 11
R54	8200Ω	½	23X20X822K	BTS-8200	Vert. Peaking
R55	220KΩ	½	23X20X224K	BTS-220K	Vert. Shaping - See Note 12

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Hallicrafters PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R56	120KΩ	½	23X20X124K	BTS-120K	Vert. Shaping - See Note 2
R57	2.2Meg	½	23X20X225K	BTS-2.2Meg	Vert. MV-Vert. Amp. Grid - See Note 18
R58	470KΩ	½	23X20X474K	BTS-470K	Vert. MV-Vert. Amp. Plate - See Note 17
R59	120KΩ	½	23X20X124K	BTS-120K	Horiz. AFC Grid - See Note 13
R60	47KΩ	½	23X20X473K	BTS-47K	Horiz. AFC Cathode - See Note 17
R61	47KΩ	½	23X20X473K	BTS-47K	Horiz. AFC Plate - See Note 6
R62	8200Ω	½	23X20X822K	BTS-8200	Horiz. AFC Filter - See Note 10
R63	180KΩ 20%	1	23X30X184K	BTA-180K	Horiz. Osc. Grid - See Note 14
R64	120KΩ	1	23X30X124K	BTA-120K	Horiz. Osc. Plate - See Note 13
R65	8200Ω	½	23X20X822K	BTS-8200	Horiz. Osc. Coil Shunt
R66	47KΩ	½	23X20X473K	BTS-47K	Horiz. Osc. Coil Shunt - See Note 6
R67	10KΩ	½	23X20X103K	BTS-10K	Voltage Divider
R68	56Ω	1			Parasitic Suppressor - See Note 2
R69	470KΩ 20%	½	23X20X474M	BTS-470K	Horiz. Output Grid
R70	100Ω	2	23X40X101K	BW-2-100	Horiz. Output Cathode
R71	18KΩ	1	23X30X183K	BTA-18K	Horiz. Output Screen - See Note 15
R72	22KΩ	½	23X20X223K	BTS-22K	Horiz. Feedback
R73	3.3Ω	1	23X20X033K	BW-1-3.3	HV Rectifier Filament - Wire Wound
R74	1000Ω	1	23X30X102K	BTA-1000	Decoupling - See Note 16
R75	150 20%	1	23X30X150M	BW-1-15	Voltage Divider - See Note 2
R76	20Ω	10	24A927	1 3/4A-20	Surge Limiter - Wire Wound
R77	120KΩ	½	23X20X124M	BTS-120K	Horiz. AFC Grid - See Note 2

† Items R50A, R50B, R50C, C45A, C45B, and C45C are combined into one unit.
Note 2 Not used in all models.
Note 3 Some models use 220Ω Resistor in this application.
Note 4 Some models use 100Ω Resistor in this application.
Note 5 Some models use 12KΩ Resistor in this application.
Note 6 Some models use 39KΩ Resistor in this application.
Note 7 Some models use 1MEg Resistor in this application.
Note 8 Some models use 220KΩ Resistor in this application.
Note 9 Some models use 8200Ω Resistor in this application.
Note 10 Some models use 3300Ω Resistor in this application.
Note 11 Some models use 1.8Meg Resistor in this application.
Note 12 Some models use 330KΩ Resistor in this application.
Note 13 Some models use 100KΩ Resistor in this application.
Note 14 Some models use 220KΩ Resistor in this application.
Note 15 Some models use 12KΩ 2 Watt Resistor in this application.
Note 16. Some models use 4700Ω ½ Watt Resistor in this application.
Note 17. Some models use parallel Resistors in this application to obtain desired value.
Note 18. Some models use series Resistor in this application to obtain desired value.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: HALLICRAFTERS PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC @ 1.2A	115VAC .925A	6.3VAC @ .9A	6.3VAC @ 1.2A	52C212			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: Hallicrafters PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	1063Ω Taps @ 4Ω, 52Ω 566, 73Ω	0Ω	55C1562				Horiz. Output Trans.
T3	1.1KΩ Tap 13Ω		55A166	A-8112	A-3037 *	TS0-5	Vert. Output Trans.
T4A	35Ω		53C203-C				Horiz. Deflection Coils
B	69Ω						Vert. Deflection Coils

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: Hallicrafters PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T5	2.3KΩ	3.3Ω	700Ω	.6Ω	55A157	A-3849	A-3025 ①	RO-2 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: Hallicrafters PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1A	PM	3.3Ω	85C104 ②	ST-115	8A31	② Used in Models 805 and 806
B	PM	3.3Ω	85C103 ③	Mod. P8-V ST105 Model P5-X	5A1	③ Used in Model 810
	CONE DIA.	V. C. DIA.				
SP2A	7 1/2"	9/16"				
B	4 7/8"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: Hallicrafters PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
L1	.200A	130Ω	1.1Henries	56B117	C-2325 ①	C-2994 ①	TR3300①	① Drill one new mounting hole.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	Hallicrafters PART No.	MEISSNER PART No.	
L2	Ant. Coil	0Ω	0Ω			
L3	Fil. Choke					
L4	RF, Mixer Grid and Osc. Coils	0Ω	0Ω			
L5	Fil. Choke					
L6	Ist. Video IF	1Ω				
L7	Grid Choke	4Ω				Wound on 33KΩ Resistor - Some Mod. have just 33KΩ Resistor
L8	2nd. Video IF	.2Ω	.2Ω	51A1288-B		
L9	3rd. Vidoe IF	.3Ω	.3Ω	51A1289-B		
L10	Peaking Coil	13Ω		51A1257		Wound on 15KΩ Resistor
L11	Peaking Coil	36Ω		51A1286		White Dot
L12	Peaking Coil	21Ω		51A1285		Blue Dot(wound on 33KΩ Resistor)
L13	Peaking Coil	22Ω		51A1284		Orange Dot
L14	Ist. Sound IF	1.2Ω		50B474-G		
L15	Ratio Det. Trans.	4.4Ω	.8Ω	50B473-D		Tap.9Ω
L16	Horiz. Osc.	80Ω	55Ω	51B1242		
L17	Horiz. Lin.	25Ω		51B1335		
L18	Width Coil	2.6Ω		51B1277		

SELENIUM RECTIFIER

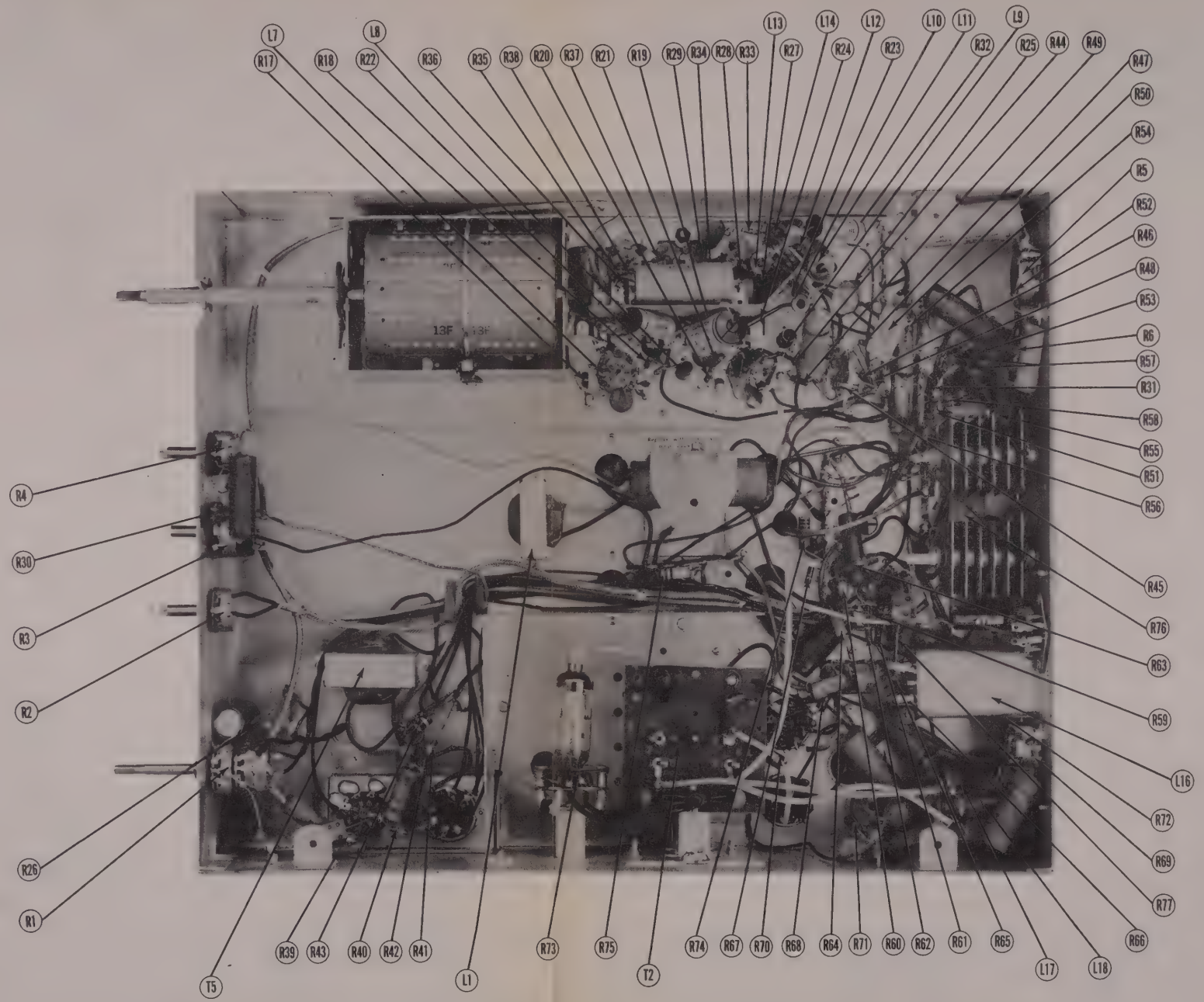
ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	HALLICRAFTER PART No.	SYLVANIA PART No.	SELETRON PART No.	
M1	.200A	27A155D	NF-5	6Q4	
M2	.200A	27A155D	NF-5	6Q4	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			HALLICRAFTERS PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M3	3AG Slo Blo	1/4A 125V	39A353	6A053	313.250	341001	
M4	3AG Pigtail	1.5A 250V	39A354		31801.5		

MISCELLANEOUS

ITEM No.	PART NAME	HALLICRAFTERS PART No.	NOTES
M5	RF Tuner	1D1049	
M6	Crystal Det.	19B1246	
M7	Focus Magnet	21C114B	
M8	Ion Trap	21A120	
	Mask Escutcheon	7D170	Mod. 805 and 806
	Mask Escutcheon	7D217	Mod. 810
	Safety Glass	22D292-D	
	Knob	15C297-C	Off/On-Volume (Mod. 805 and 810)
		15C298	Off/On-Volume (Mod. 806)
		15A299	Fine Tuning -(Mod. 805 and 810)
		15A300	Fine Tuning -(Mod. 806)
		15D265-F	Contrast -(Mod. 805 and 810)
		15A274	Contrast -(Mod. 806)
		15A284	Phono/TV Brightness(Mod. 805 and 810)
		15A285	Phono/TV Brightness(Mod. 806)
		15D293-C	Channel Selector -(Mod. 805 and 810)
		15D294	Channel Selector -(Mod. 806)



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

JEWEL
MODEL 5020

JEWEL
MODEL 5020

TRADE NAME	Jewel, Model 5020
MANUFACTURER	Jewel Radio Co., 10-40 45th. Ave., Long Island City, New York
TYPE SET	AC Operated Combination Phono-Radio, Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 12SA7 Converter, 12BA6 IF Amp., 12SQ7 DET.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC RATING .25 Amp., @ 117 Volts AC
TUNING RANGE—BROADCAST	545-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning cap fully closed and set pointer parallel with base of dial.
Use isolation transformer if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD.	High side to stator on rear section of tuning gang. Low side to B-.	455KC (400~Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulatinn.
2.		Loop	1650KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver Adjust for maximum output.
3.		Loop	1500KC	Tune for max. output.	"	A6	"

FOR SERVICE INFORMATION ON RECORD CHANGER SEE WEBSTER-CHICAGO MODEL 100 IN PHOTOFACT SET 135 FOLDER 14.

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PARTS LIST AND DESCRIPTIONS

JEWEL MODEL 5020

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: JEWEL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12SA7	12SA7	8R	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	DET.-AVC-AF	12SQ7	12SQ7	8Q	
V4	Power output	50L6GT	50L6GT	7AC	
V5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: JEWEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	150	31-30A	PRS150/40-40-40		EDL44215		TVA-3451	Filter Red
B	40	150							Filter Green
C	20	150							Filter Blue
C2	.05	200	32-4	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C3	.1	400	32-57	P488-1	DF-104	PTE4P1		72P52	Line Isolation
C4	100	500	35-4	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Diode RF Filter
C5	.01	600	32-1	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Phono Isolation
C6	100	500	35-4	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Tone Comp. *
C7	.005	600	32-35	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C8	100	500	35-4	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	AF Amp. Plate
C9	.01	400	32-1	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C10	5000		35-28	BPD-005	DD-502	1D5D5	811-005	29C1	Tone Comp.
C11	.02	400	32-3	P488-02	DF-203	PTE4S2		4TM-S2	Output Plate
C12	.047	400	32-55	P488-047	DF-503	PTE4S5		4TM-S47	Line Filter

* Some models use 500MMF in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: JEWEL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	50-19	Q13-133	AG-60-Z	BSK-60-S	Volume Control
B	Shaft		Not req.	Not req.	KSS-3	Not req.	Attach to R1A per instructions
C	Switch		Not req.	76-1	SWB	Not req.	Attach to R1A per instructions
R2	1Meg	½	50-31				Tone Control and Radio-Phono SW

RESISTORS

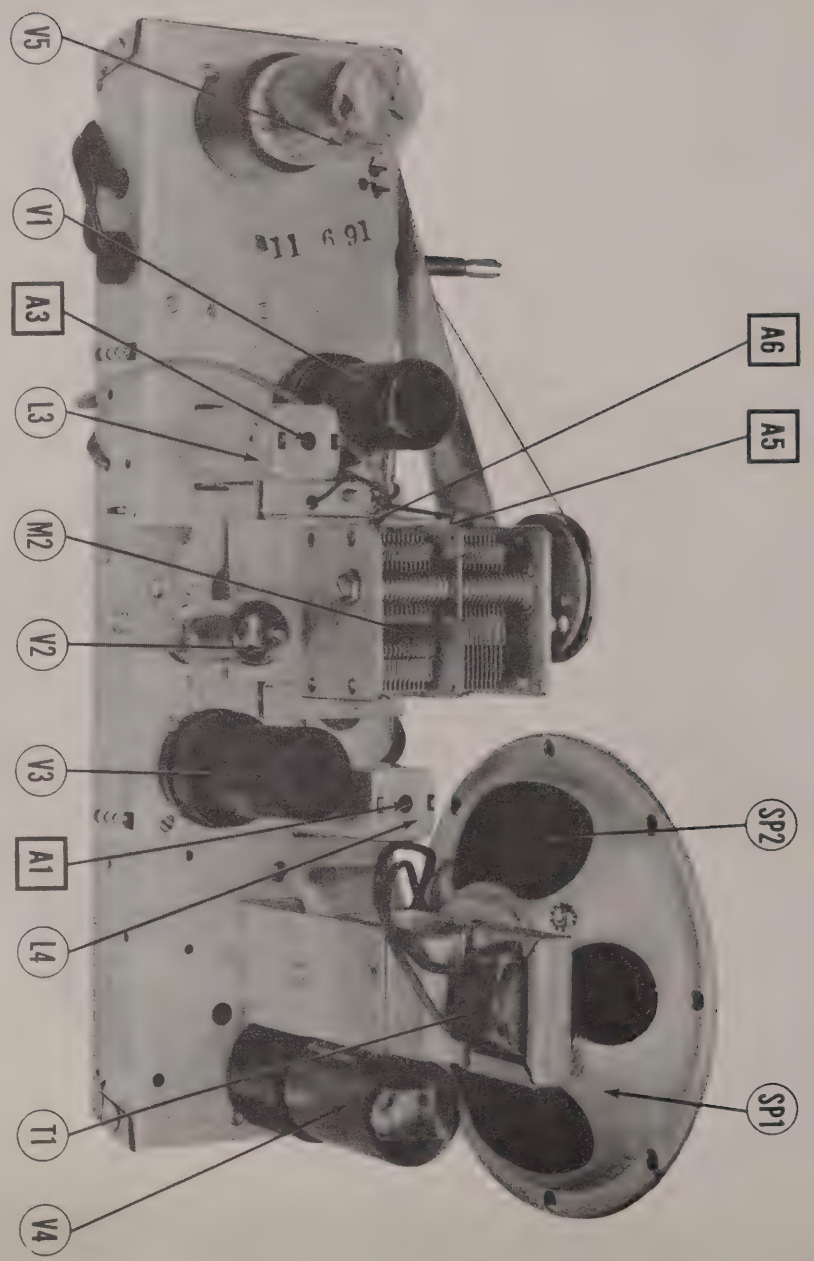
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: JEWEL PART No.	IRC PART No.	IDENTIFICATION CODES
R3	22KΩ	½	20-82	BTS-22K	Osc. Grid
R4	150Ω	½	20-89	BTS-150	IF Amp. Cathode
R5	2.7Meg	½	20-56	BTS-2.7Meg	AVC Network - See Note 1
R6	10Meg	½	20-57	BTS-10Meg	AF Amp. Grid
R7	220KΩ	½	20-74	BTS-220K	AF Amp. Plate
R8	470KΩ	½	20-92	BTS-470K	Output Grid
R9	150Ω	½	20-81	BTS-150	Output Cathode
R10	100Ω	½	20-40	BTS-100	Filter
R11	1500Ω	1	20-73	BTA-1500	Filter
R12	22Ω	½	20-93		Rectifier Ballast
R13	120KΩ	½	20-144	BTS-120K	Isolation - See Note 2

Note 1 Some models use 3.3Meg Resistor in this application.
Note 2 Some models use 150KΩ Resistor in this application

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: JEWEL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	2.8KΩ	3Ω	165Ω	.4Ω	Part of SP1	A-3332 ①	A-3025 ①	R0-2 ①	① Bend mounting tabs down, file out slots, and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			JEWEL PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.				② Includes output transformer
SP1	PM	3Ω	80-23B ②	ST105 ③ Model P5-X	5A1 ③	③ Fabricate new mounting bracket
	CONE DIA.	V. C. DIA.				
SP2	4 3/4"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	JEWEL PART No.	MEISSNER PART No.	
L1	Loop Ant.	3.3Ω		62-20		
L2	Osc. Coil	.5Ω	6.8Ω	60-18		
L3	1st. IF	25Ω	25Ω	61-11		
L4	2nd. IF	25Ω	25Ω	61-11		

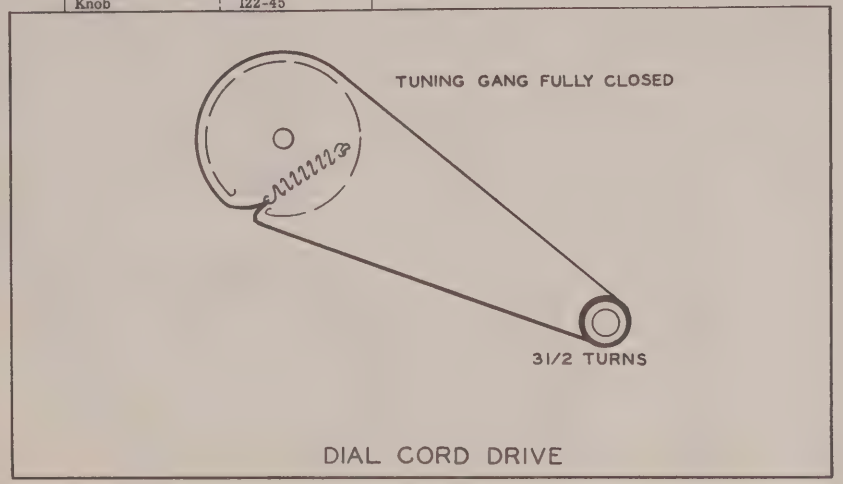
PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA							REMARKS
	JEWEL PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		ACD-2J	A-1 A-3	W22AB-T	A62A A65 MG	96-T	0-3 or S-3 and 0-1 or S-1	

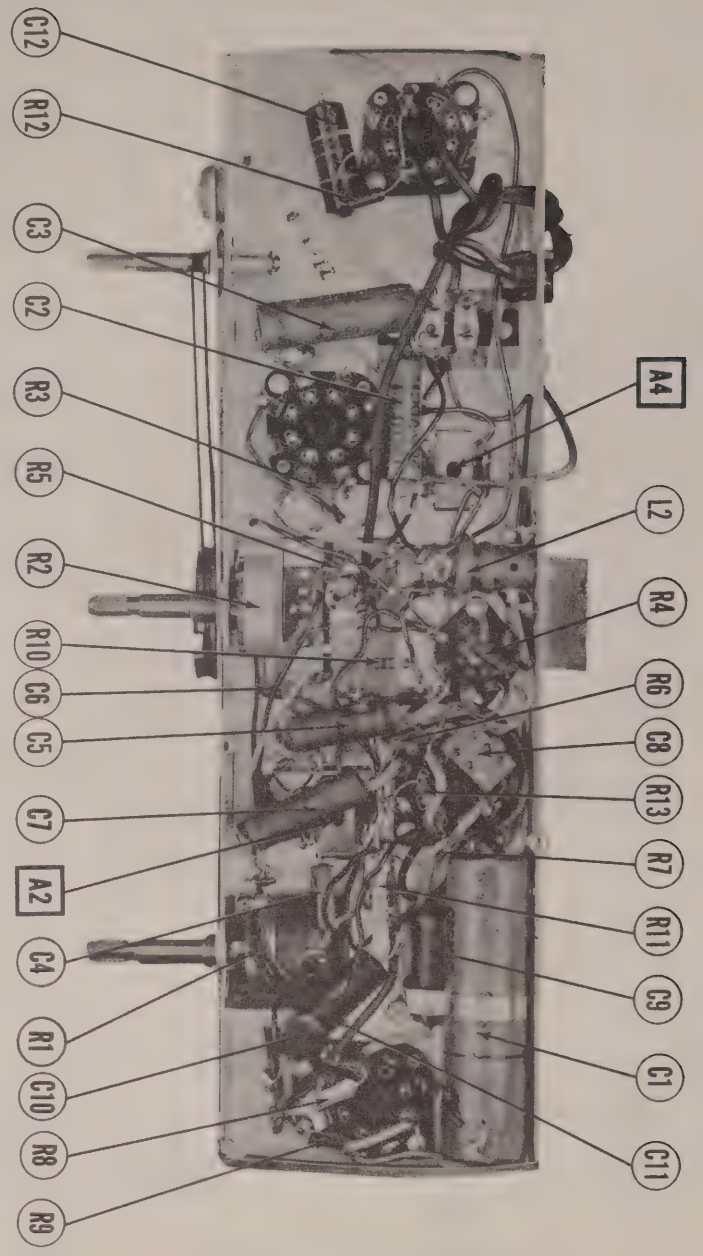
ASTATIC, SHURE, AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

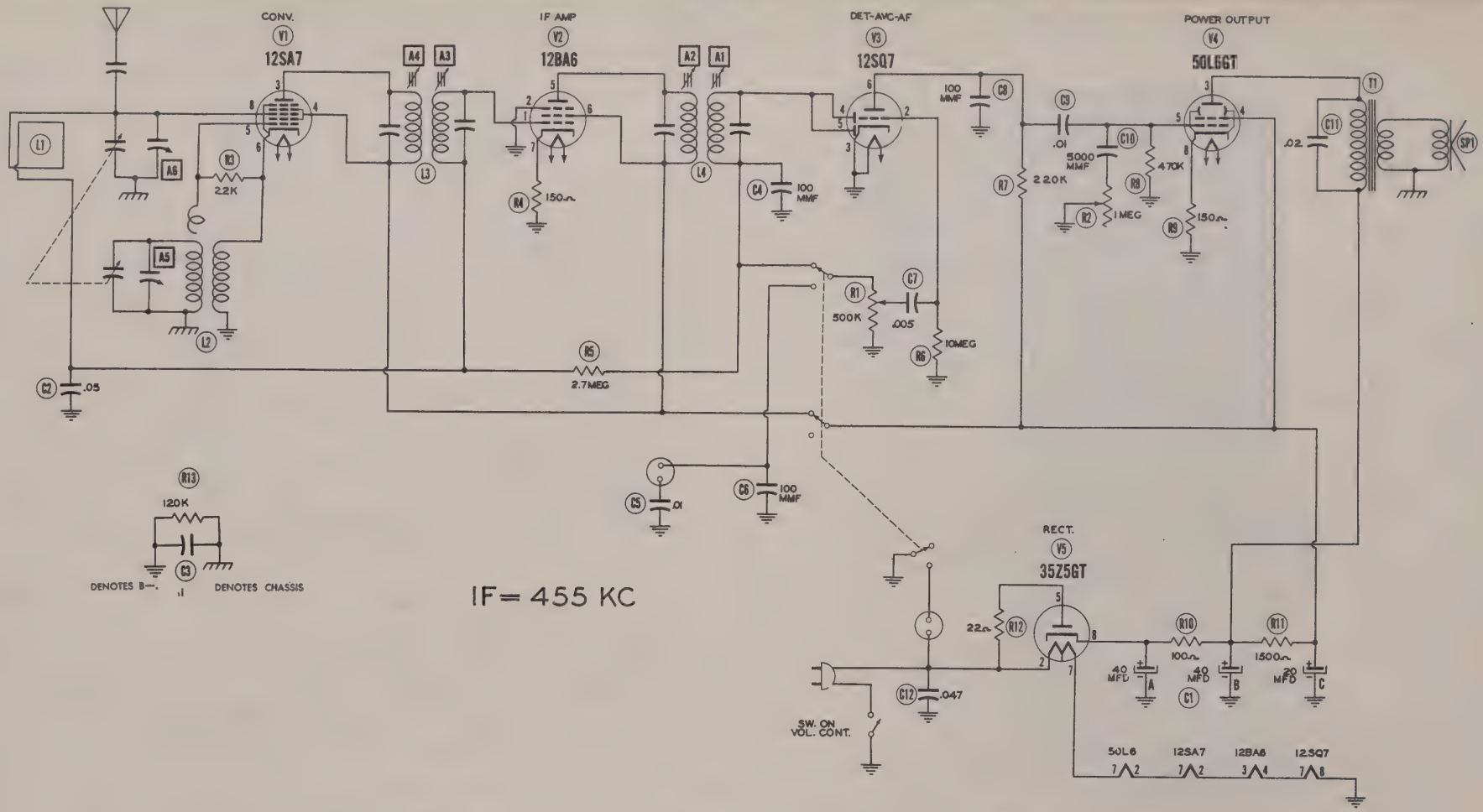
MISCELLANEOUS

ITEM No.	PART NAME	JEWEL PART No.	NOTES
M2	2 Gang var. Cap.	30-20A	(420 & 162MMF)
	Cabinet	120-65	
	Dial	130-89	
	Knob	122-26	Pointer
	Knob	122-45	



CHASSIS—BOTTOM VIEW





IF = 455 KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	0V	25VAC	87VDC	87VDC	8-5.4VDC	0V	37VAC	-.1VDC
V 2	12BA6	-.1VDC	0V	25VAC	12VAC	87VDC	87VDC	1.4VDC	
V 3	12SQ7	0V	-.6VDC	0V	-.3VDC	.3VDC	60VDC	12VAC	0V
V 4	50L6GT	0V	37VAC	112VDC	87VDC	0V	0V	85VAC	5.6VDC
V 5	35Z5GT	0V	85VAC	90VDC	117VAC	112VAC	0V	117VAC	125VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	120KΩ	25Ω	†1.6KΩ	†1.6KΩ	22KΩ	.5Ω	37Ω	3.2Meg
V 2	12BA6	3.2Meg	0Ω	25Ω	13Ω	†1.6KΩ	†1.6KΩ	150Ω	
V 3	12SQ7	120KΩ	10Meg	0Ω	500KΩ	500KΩ	†220KΩ	13Ω	0Ω
V 4	50L6GT	Inf.	37Ω	†265Ω	†1.6KΩ	470KΩ	Inf.	90Ω	150Ω
V 5	35Z5GT	Inf.	90Ω	100Ω	130Ω	150Ω	Inf.	130Ω	40KΩ

RADIO-PHONO SWITCH IN RADIO POSITION

† MEASURED FROM PIN 8 OF V5

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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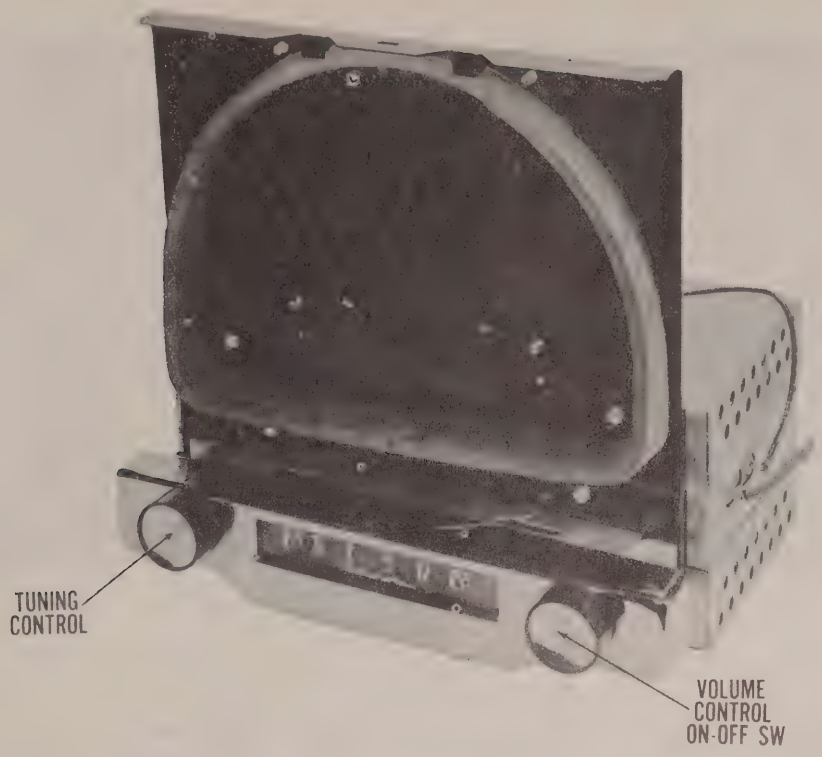
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



TRADE NAME	Motorola, Chassis 1B
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago, Illinois
TYPE SET	Battery Operated Custom-Built Automotive Superheterodyne Receiver
TUBES (SIX)	Types 6BA6 RF Amp., 6BE6 Converter, 6BA6 IF Amp., 6AV6 DET-AVC-AF, 6AS5 Power Output, 6X4 Rectifier
POWER SUPPLY	6Volt Storage Battery — RATING 5.2Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid of 6BE6 (V2) Low side to chassis.	455KC (400∿ Mod.)	Tuning cores fully out.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	High side thru dummy to ant. receptacle. Low side to chassis.	1610KC	Tuning cores fully out. Check to see that cores project 1 1/8 ins. out of cans.	"	A5, A6, A7	Adjust for maximum output.
3.	"	"	1425KC	1425KC See Fig. 2	"	A8, A9, A10	Adjust for maximum output. Set pointer over the small hole in dial backplate.

After set is installed, fully extend the antenna and tune in a weak station near 1400KC. Adjust A7 for maximum volume.

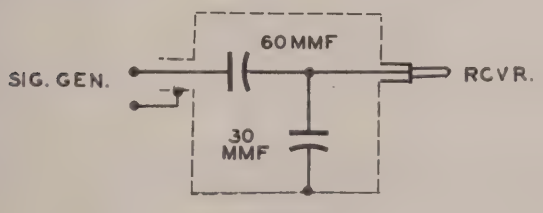


FIG. 1

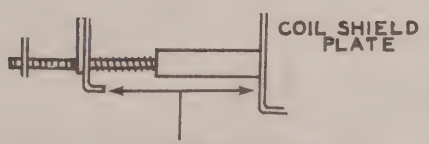


FIG. 2

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PARTS LIST AND DESCRIPTIONS

MOTOROLA CHASSIS 1B

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det.-AVC-AF	6AV6	6AV6	7BT	
V5	Power Output	6AS5	6AS5	7CV	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	20	250	2A500059	AF43F4A		UP215525C		TVL-3565	■ Filter
B	10	250							▲ Filter
C	10	25							Output Cathode
C2	100		21B77562	SI100	D6-101	5W5T1	GP1K-101	19C11	Fixed Trimmer
C3	.006	100	8A4529	P688-006	D6-562	PTE6D6	GP2-333-602	6TM-D6	RF Coupling
C4	.05	100	8K13514	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C5	5		21K70720	SI5	TCZ-4.7	5W5V5	GP1K-050	MS-55	RF Coupling
C6	.05	200	8R23146	P288-05	DF-503	PTE4S5		2TM-S5	Decoupling
C7	50	500	21K592375	1468-00005	D6-500	5W5Q5	GP1K-500	1FM-45	Osc. Grid Cap.
C8	.01	100	8K472754	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C9	.01	400	8R23690	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Aduio Coupling
C10	250	500	21R6543	1468-00025	D6-251	5W5T25	GP2K-250	1FM-325	Output Grid
C11	.01	400	8R23690	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Output Plate
C12	.03	600	8K592154	P688-03		PTE6S3		6TM-S3	Buffer
C13	.5	100	8K17028	P185-5				68P20	Hash Filter
C14	.5	100	8K17028	P185-5				68P20	Hash Filter

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	18A591978	Q14-133			Volume Control
B	Switch		Not req.	76-1			Attach to R1A per instructions

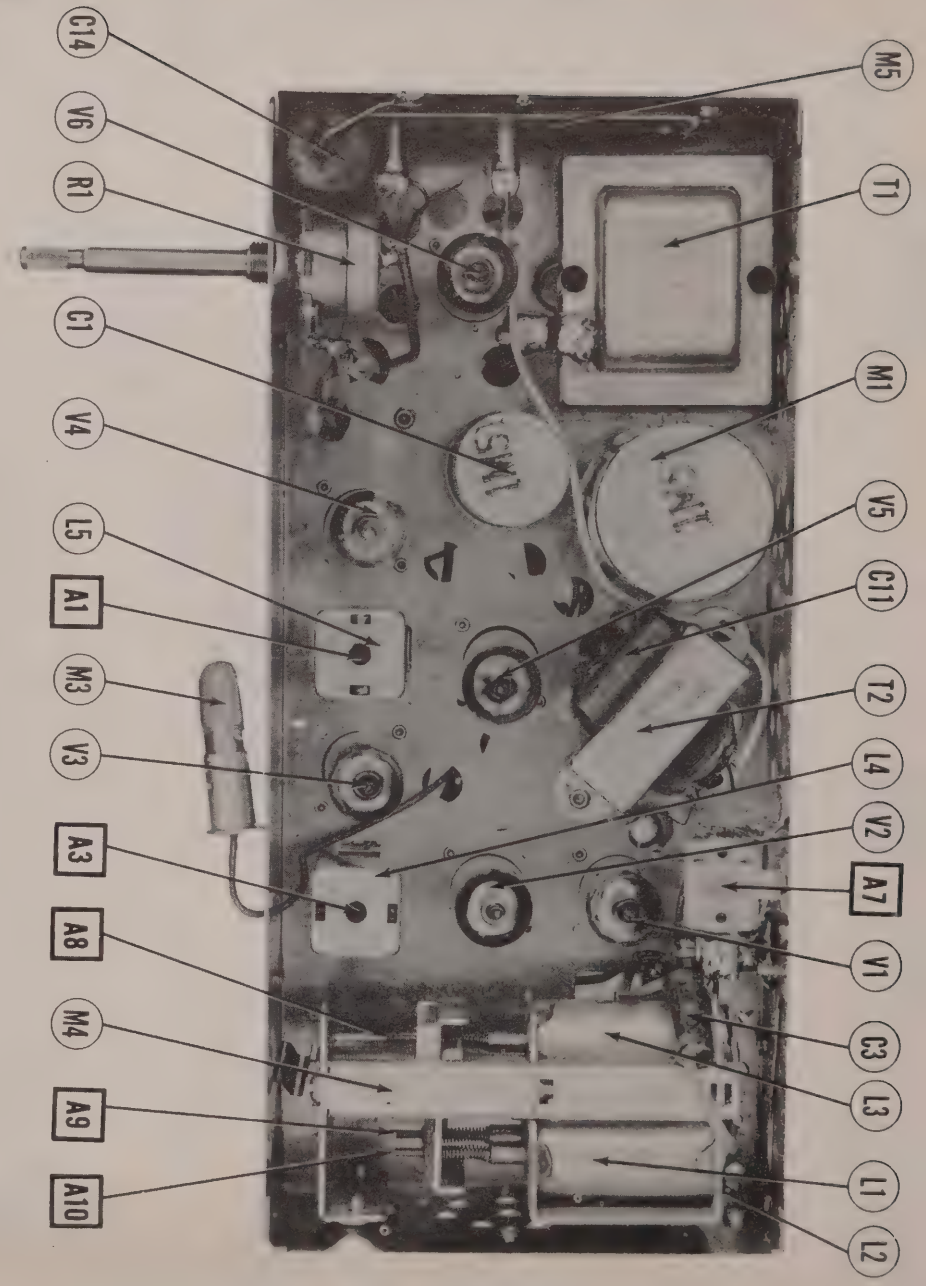
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES
R2	470KΩ	½	6R6032	BTS-470K	RF Amp. Grid
R3	470Ω	½	6R6090	BTS-470	RF Amp. Cathode
R4	100KΩ	½	6R6075	BTS-100K	Conv. Grid
R5	47KΩ	½	6R6056	BTS-47K	Osc. Grid
R6	390Ω	½	6R5554	BTS-390	IF Amp. Cathode
R7	3900Ω	1	6R5618	BTA-3900	Decoupling
R8	1Meg	½	6R6004	BTS-1Meg	AVC Network
R9	4.7Meg	½	6R2122	BTS-4.7Meg	AF Amp. Gird
R10	220KΩ	½	6R6015	BTS-220K	AF Amp. Plate
R11	470KΩ	½	6R6032	BTS-470K	Output Grid
R12	270Ω	1	6R6336	BTA-270	Output Cathode
R13	2200Ω	1	6R6006	BTA-2200	Filter
R14	56	½	6R5614		Hash Suppressor
R15	56	½	6R5614		Hash Suppressor

TRANSFORMER (VIBRATOR)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	6.3V @ 2.4A	340VCT .045ADC			25C591533			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	5.3KΩ	2.8Ω	405Ω	.62Ω	25B70171	A-3878	A-2930	R0-9 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.				
SP1	PM	3.6Ω	50B592479	57J9	57A1	
	CONE DIA.	V. C. DIA.				
SP2	5"X7"	9/16				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
L1	Ant. Coil	13Ω		24B71881		
L2	RF Coil	13Ω		24B71881		
L3	Osc. Coil	.8Ω	3.4Ω	24B592153		
L4	1st. IF Coil	20Ω	20Ω	24B485553		
L5	2nd. IF Coil	20Ω	20Ω	24B485554		
L6	Hash Choke	.1Ω		24A472535		

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FRE-QUENCY	REPLACEMENT DATA				INSTALLATION NOTES
				MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	RADIART PART No.	
M1	INT	6.3V	115∿	48B3333	A-200	5342	5342	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			MOTOROLA PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M2	SFE	9Amp.	6SK16248	9B473111	307009	155009A	

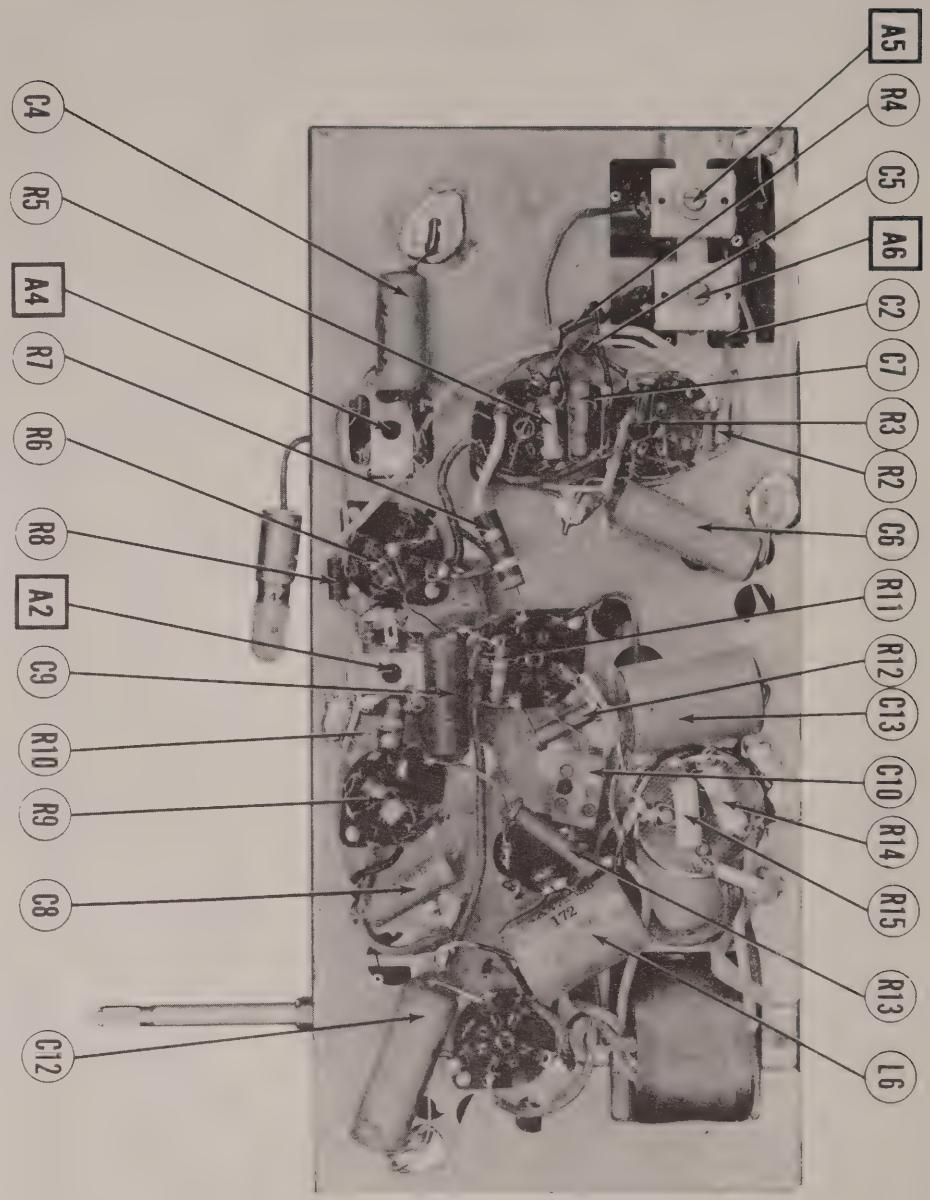
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					MOTOROLA PART No.		
M3	Bayonet	6-8	.25	Blue	65X10856		Type TS-44

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Tuning Unit	1X592120	
M5	Spark Plate	1B592173	
A5	Trimmer	20A591977	Osc. Adj.
A6	Trimmer	20A481526	RF Adj.
A7	Trimmer	20K591969	Ant. Adj.

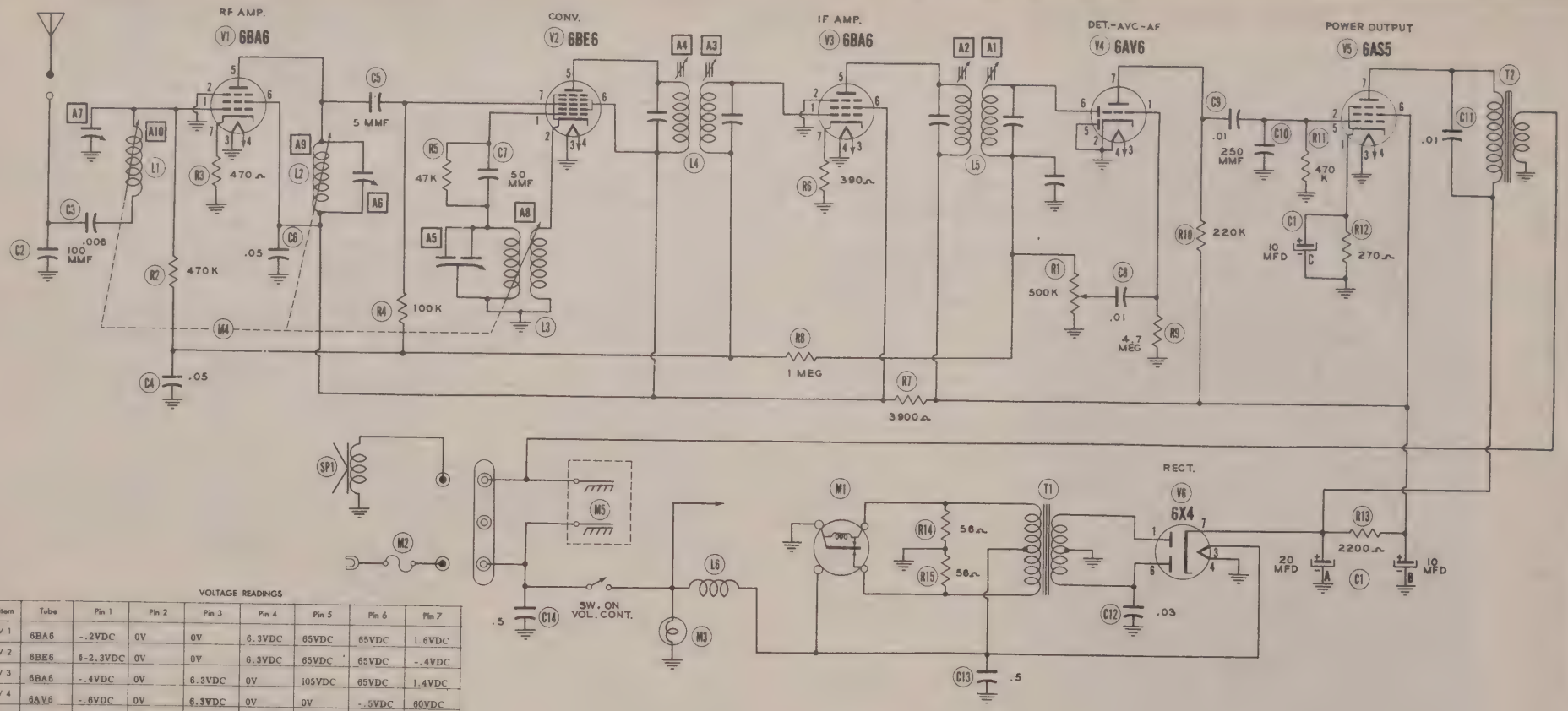
CHASSIS—BOTTOM VIEW



SET 136 FOLDER 11

MOTOROLA CHASSIS 1B

MOTOROLA CHASSIS 1B



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	-.2VDC	0V	0V	6.3VDC	65VDC	65VDC	1.6VDC
V 2	6BE6	§-2.3VDC	0V	0V	6.3VDC	65VDC	65VDC	-.4VDC
V 3	6BA6	-.4VDC	0V	6.3VDC	0V	105VDC	65VDC	1.4VDC
V 4	6AV6	-.6VDC	0V	6.3VDC	0V	0V	-.5VDC	60VDC
V 5	6AS5	9VDC	0V	0V	6.3VDC	6VDC	105VDC	120VDC
V 6	6X4	160VAC	0V	6.3VDC	0V	0V	160VAC	135VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	2Meg	0Ω	0Ω	.4Ω	†6.1KΩ	†6.1KΩ	470Ω
V 2	6BE6	47KΩ	.8Ω	0Ω	.4Ω	†6.1KΩ	†6.1KΩ	1.6Meg
V 3	6BA6	1.5Meg	0Ω	.4Ω	0Ω	†2.2KΩ	†6.1KΩ	390Ω
V 4	6AV6	4.7Meg	0Ω	.4Ω	0Ω	0Ω	500KΩ	†222KΩ
V 5	6AS5	270Ω	470KΩ	0Ω	.4Ω	470KΩ	†2.2KΩ	†405Ω
V 6	6X4	.3Ω	Inf.	.4Ω	0Ω	Inf.	.3Ω	100KΩ

† MEASURED FROM PIN 7 OF V6

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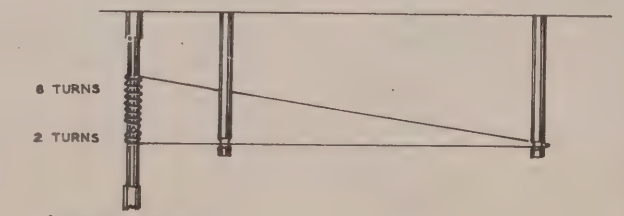

DIAL CORD DRIVE

IF = 455 KC

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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136-11

1 - DC Voltage measurements are at 20,000 ohms per volt; AC voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6 volts for volt readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

PHILCO MODELS 51-PT1207, 51-PT1208, 51-PT1234, 51-PT1282

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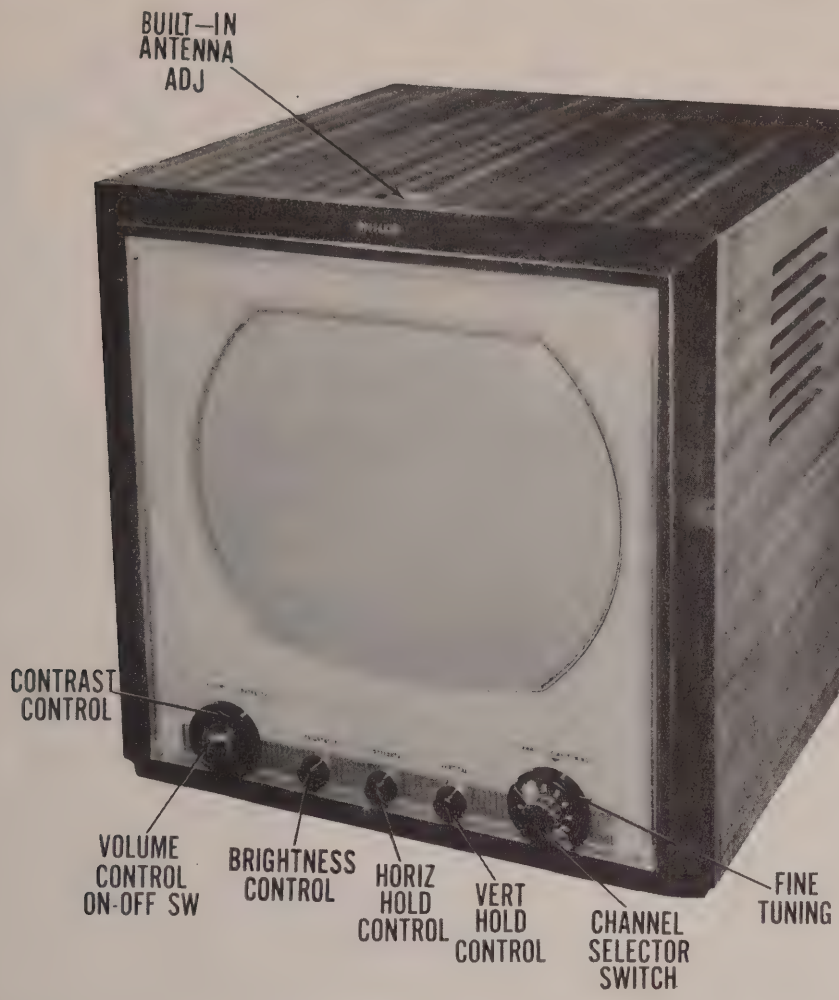
DATE 6-51 SET 136 FOLDER 12

PHILCO MODELS 51-PT1207, 51-PT1208, 51-PT1234, 51-PT1282



PHILCO MODELS 51-PT1207, 51-PT1208, 51-PT1234, 51-PT1282

PHILCO MODEL 51-PT1208

TRADE NAME	Philco, Models 51-PT1207, 51-PT1208, 51-PT1234, 51-PT1282 (All Code 121)
MANUFACTURER	Philco Corp., Tioga And "C" Sts., Philadelphia, Pa.
TYPE SET	Television Receiver (Models 51-PT1282 Has Phonograph)
TUBES	Eighteen
POWER SUPPLY	110-120 Volts AC - 60 Cycle
TUNING RANGE–	Channels 2 thru 13

RATING 1.24 Amp. @ 117 Volts AC

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RECORD CHANGER UNIT FOR MODEL 51-PT1282 - PHILCO MODEL M-22

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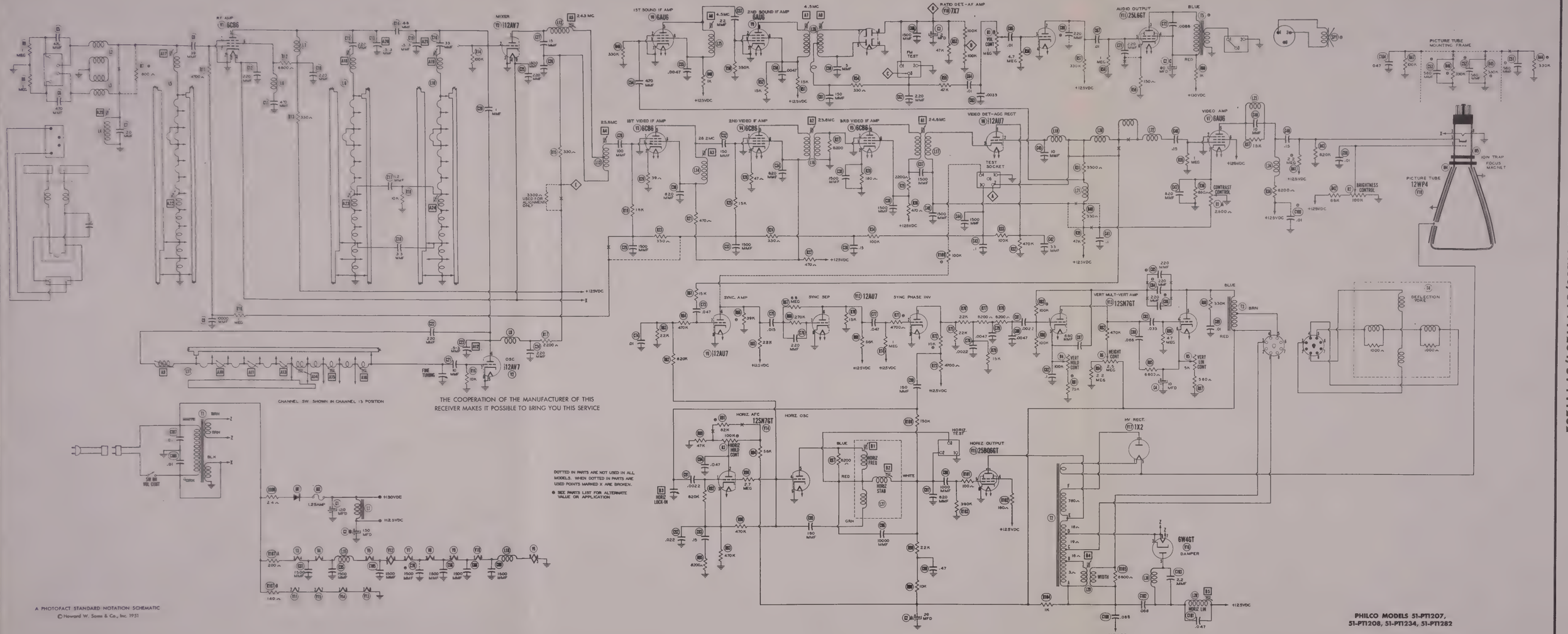

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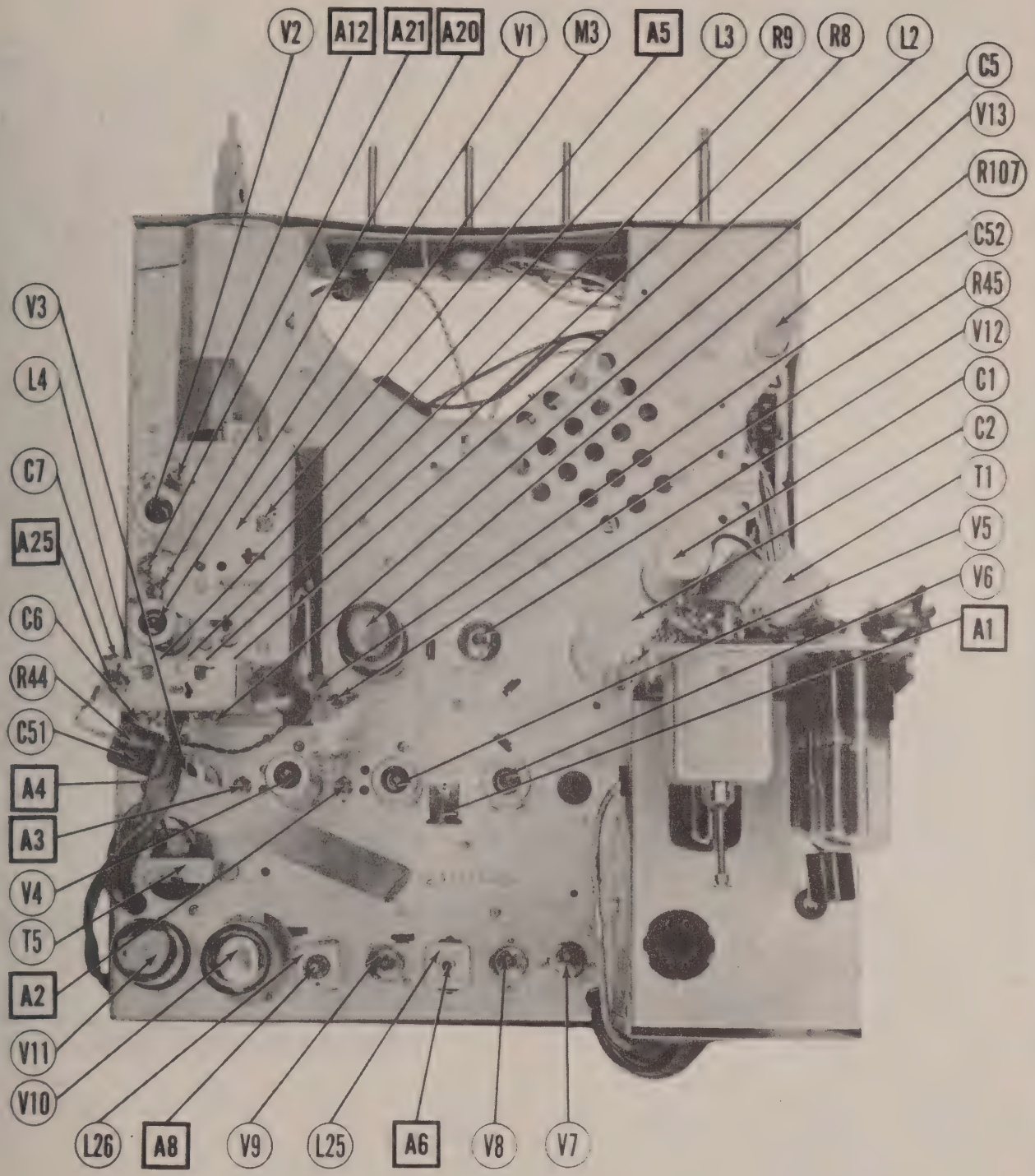
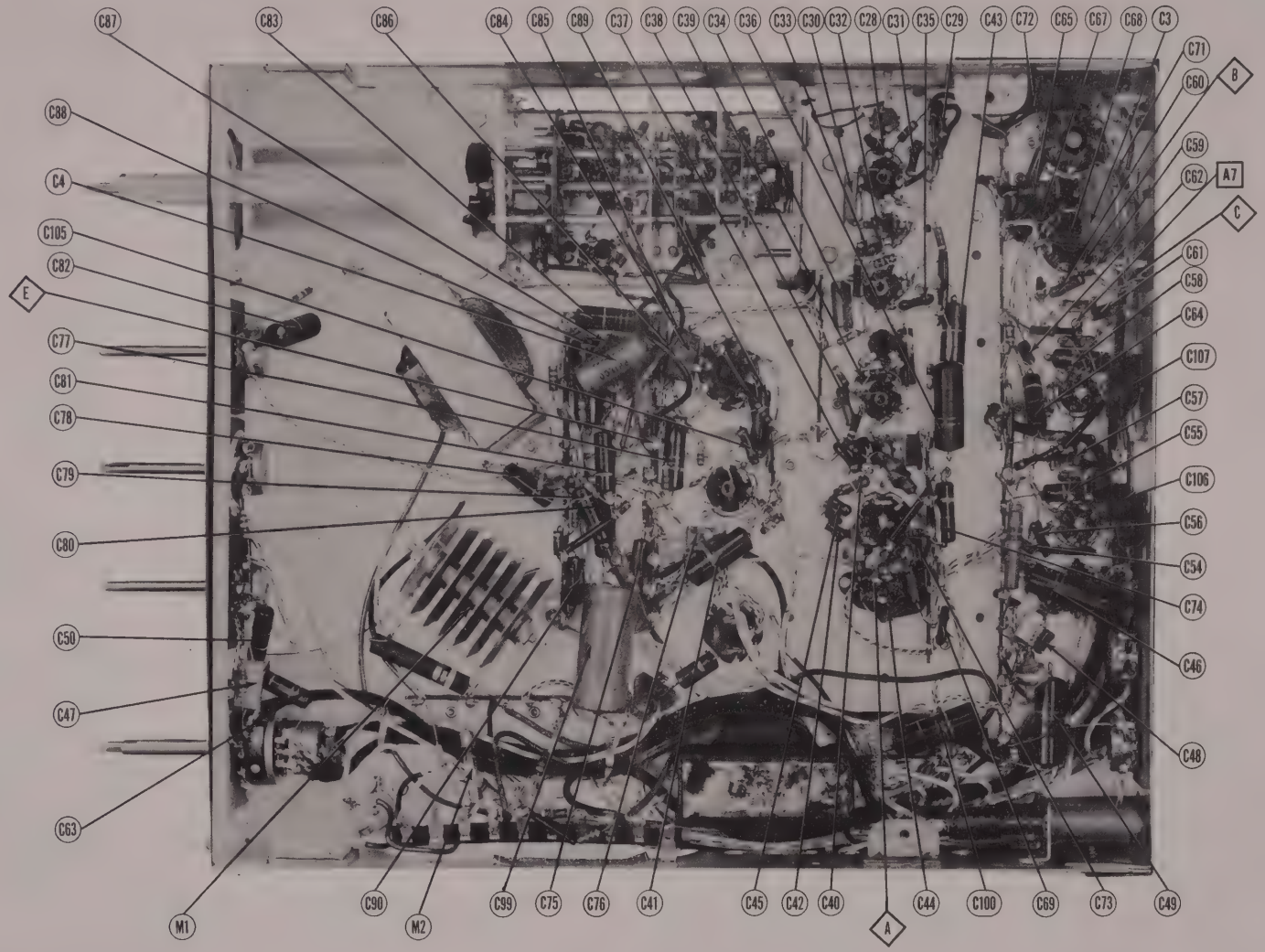
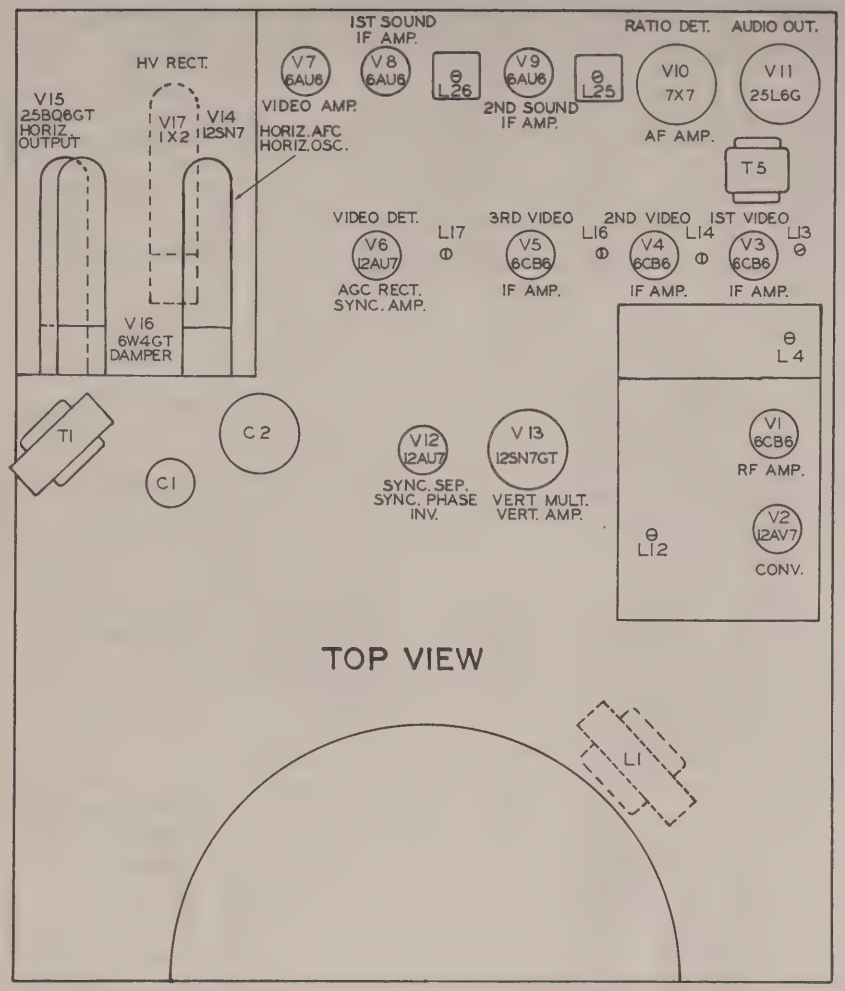
PHILCO MODELS 51-PT1207, 51-PT1208, 51-PT1234, 51-PT1282

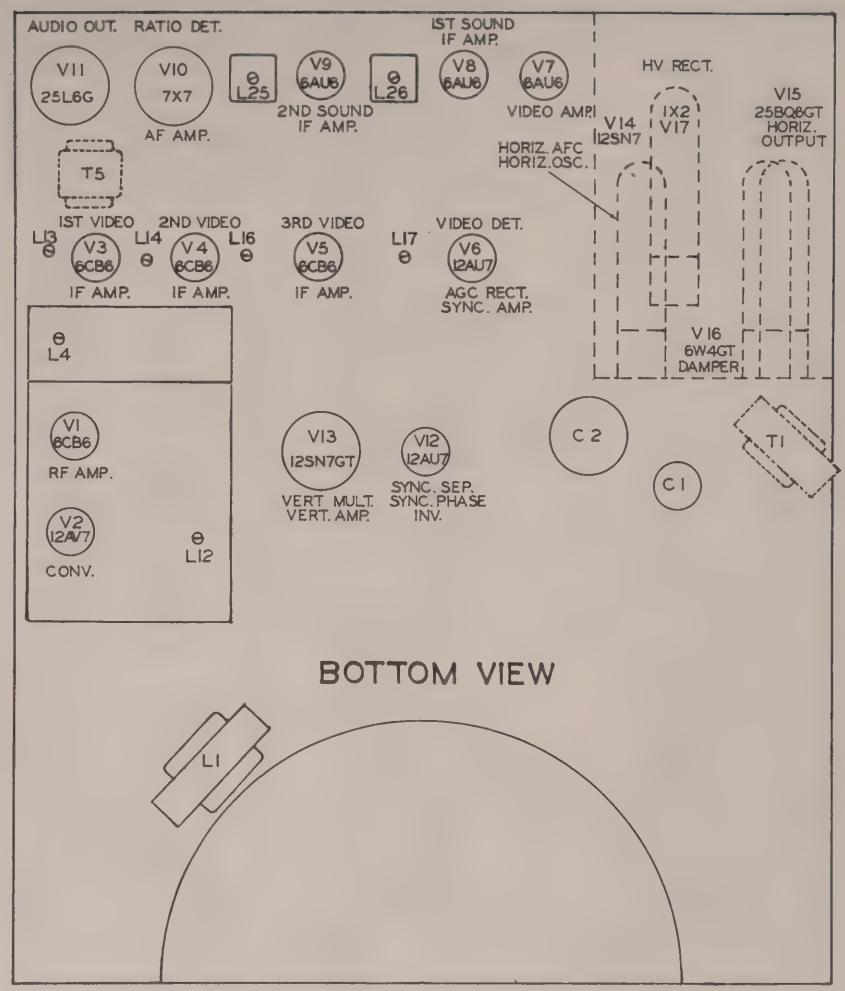


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW- CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

PHILCO MODELS 51-PT1207, 51-PT1208, 51-PT1234, 51-PT1282

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube. Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Remove the converter tube, (V2), and replace it with a 12AV6 which has Pin 6 removed. This will disable the local oscillator and prevent the possibility of erroneous indications.

Turn the contrast control to MINIMUM, (maximum counter-clockwise).

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	24.8MC (Unmod.)	Any	DC probe to Point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	23.6MC	"	"	A2	"
3.	"	"	26.2MC	"	"	A3	"
4.	"	"	25.8MC	"	"	A4	"
5.	"	"	24.3MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	25MC (10MC SWP)	22.1MC 26.6MC	Any	Vert. amp. to Point (A). Low side to chassis.		Check for response curve similar to figure 1. If necessary retouch A1 thru A5 for proper response. If any adjustment requires considerable change repeat VTVM alignment.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from Point B to chassis. The junction of these two resistors is alignment Point D as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to Pin 1 (grid) of 6AU6 (V8). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to Point (B). Common to chassis.	A6, A7	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to Point (C). Common to Point (D).	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to Pin 1 (grid) of 6AU6, (V8). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. amp. to Point (B). Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C3. Adjust for maximum amplitude and symmetry as per figure 2.
8.	"	"	"	"	"	Vert. amp. to Point (C). Low side to chassis.	A8	Reconnect capacitor C3. Adjust A8 so 4.5MC occurs at center of crossover lines as per figure 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 12AV6 in its socket.

Unsolder the red lead from the tuner and connect a 3300Ω resistor in series with it. The tuner end of the resistor is alignment Point E as shown on the schematic.

Unsolder the white lead from the tuner and connect it to the negative terminal of a 1.5 volt battery, connect the positive battery terminal to chassis.

Pre-set the fine tuning control so the edge of the cam is centered on the channel 6 adjusting screw.

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	Not used	237.85MC (Unmod.)	13	Vert. amp. to Point (E). Low side to chassis.	A9	Adjust for zero beat indication on scope. This will be indicated by a narrow trace between two wide traces.
10.	"	"	"	225.85MC	11	"	A10	"
11.	"	"	"	213.85MC	9	"	A 11	"
12	"	"	"	207.85MC	8	"	A12	Check the oscillator frequency on channel 8. If the oscillator is high turn A12 several turns counter-clockwise. If the oscillator is low turn A12 clockwise. Repeat steps 9, 10, 11, and 12 until the oscillator is within 500KC on channels 13, 11, 9 and 8.
13.	"	"	"	201.85MC	7	"	A13	Adjust for zero beat as in step 9.
14.	"	"	"	109.85MC	6	"	A14	"
15.	"	"	"	93.85MC	4	"	A15	"
16.	"	"	"	81.85MC	2	"	A16	"

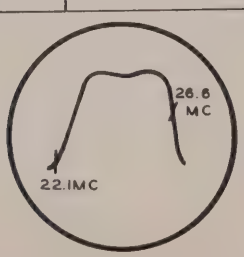


FIG. 1

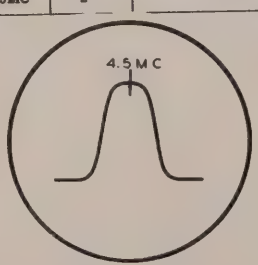


FIG. 2

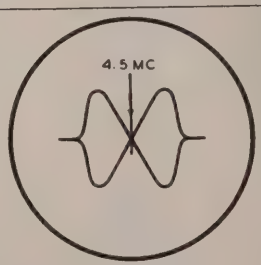


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

RF ALIGNMENT

Retain the 1.5 volt bias used during oscillator alignment.
Connect a 330Ω resistor between Pin 1 of V3 and chassis.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. amp. to Point (E) Low side to chassis.	A17, A18, A19	Adjust A17 for maximum curve height and symmetry. Adjust A18, and A19 for symmetrical response centered about 213MC.
18.	"	"	177MC (10MC SWP)	175.25MC 179.75MC	7	"	A20, A21	Examine the response cureve with respect to "tilt" and center frequency. Adjust A20 and A21 until the response in a mirror image of the original. This is necessary to compensate for the channel 13 adjustments. See figure 4A and 4B for example of compensation. Repeat the adjustments of A18, A19 and step 18 until the response is correct or both channels 7 and 13.
19.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A22, A23, A24	Adjust A22 for maximum curve height and symmetry. Adjust A23 and A24 for a symmetrical response centered about 85MC. Recheck all channels to see if the response falls within the limits of figure 5.

FM TRAP ADJUSTMENT

The FM trap A25 has been pre-set at the factory to reject 100MC. The trap is very broad and will not be normally require adjustment in the field. However, if interference is encountered from a strong FM station, A25 may be adjusted to reduce or eliminate the interference.

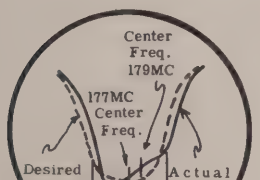


FIG. 4A

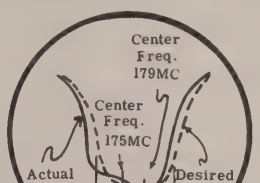


FIG. 4A COMPENSATED

FIG. 4B

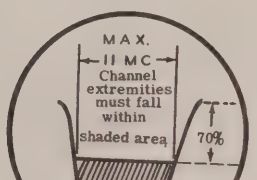


FIG. 5

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	-1VDC	0V	0V	6.3VAC	120VDC	115VDC	0V		
V 2	12AV7	125VDC	-1.7VDC	0V	0V	0V	95VDC	§-3.4VDC	0V	6.3VAC
V 3	6CB6	-1.6VDC	.2VDC	55VAC	49VAC	105VDC	110VDC	0V		
V 4	6CB6	-.6VDC	.5VDC	49VAC	42VAC	110VDC	115VDC	0V		
V 5	6CB6	0V	2.2VDC	42VAC	37VAC	95VDC	120VDC	0V		
V 6	12AU7	-2.2VDC	-.6VDC	.1VDC	0V	0V	55VDC	-2.2VDC	0V	6VAC
V 7	6AU6	0V	0V	31VAC	25VAC	110VDC	125VDC	2.4VDC		
V 8	6 AU6	-2VDC	0V	25VAC	18VAC	115VDC	115VDC	0V		
V 9	6AU6	-3VDC	0V	18VAC	13VAC	49VDC	49VDC	0V		
V 10	7X7	13VAC	70VDC	-.6VDC	0V	-1.2VDC	-3.2VDC	-53VDC	6VAC	
V 11	25L6	0V	75VAC	85VDC	95VDC	0V	0V	50VAC	6.3VDC	
V 12	12AU7	37VDC	.4VDC	0V	37VAC	37VAC	26VDC	-5VDC	0V	31VAC
V 13	12SN7	-.8VDC	52VDC 195VDC	6.9VDC	0V	225VDC	6.2VDC 14VDC	12VAC	0V	
V 14	12SN7	-1.2VDC	80VDC	-1.8VDC	-41VDC	265VDC	0V	25VAC	13VDC	
V 15	25BQ6	0V	50VAC	125VDC	125VDC	-21VDC	125VDC	25VAC	0V	TOP CAP *
V 16	6W4	0V	0V	280VDC	0V	125VDC	0V.	280VDC	280VDC	
V 17	1X2	* DO NOT MEASURE								TOP CAP *
V 18	12WP4	.1VDC	0V	6.3VAC	0V	23VDC	0V	0V	0V	0V

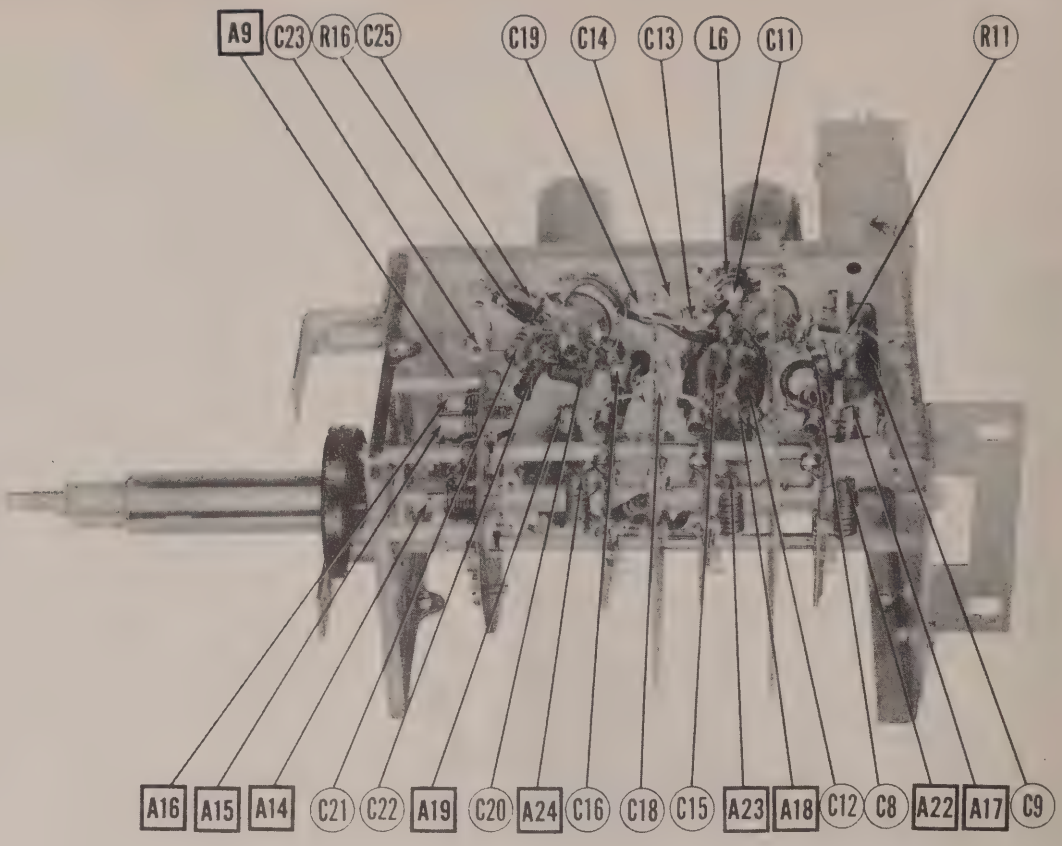
ALL MEASUREMENTS WITH PICTURE TUBE REMOVED
* DO NOT MEASURE
§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

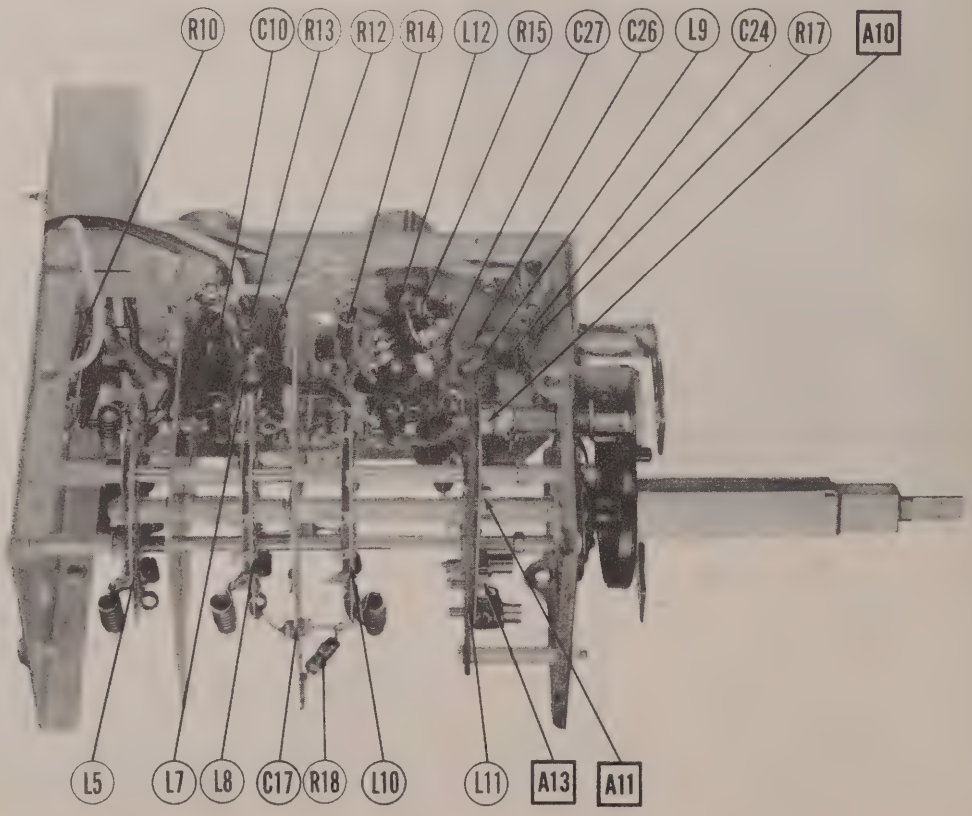
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	1.7Meg	0Ω	0Ω	.2Ω	†360Ω	†7.2KΩ	0Ω		
V 2	12AV7	†360Ω	100KΩ	0Ω	0Ω	0Ω	†2.2KΩ	10KΩ	0Ω	.2Ω
V 3	6CB6	690KΩ	39Ω	30Ω	28Ω	†940Ω	†940Ω	0Ω		
V 4	6CB6	685KΩ	47Ω	28Ω	26Ω	†470Ω	†470Ω	0Ω		
V 5	6CB6	.1Ω	180Ω	25Ω	23Ω	†2.7KΩ	†470Ω	0Ω		
V 6	12AU7	470KΩ	3.6KΩ	300Ω	0Ω	0Ω	16KΩ	495KΩ	0Ω	6Ω
V 7	6AU6	1Meg	0Ω	20Ω	16Ω	†6.2KΩ	†34Ω	450Ω		
V 8	6AU6	330KΩ	0Ω	16Ω	13Ω	†1KΩ	†1KΩ	0Ω		
V 9	6AU6	330KΩ	0Ω	13Ω	9Ω	†7.5KΩ	†7.5KΩ	0Ω		
V 10	7X7	9Ω	†330KΩ	4.7Meg	0Ω	Inf.	47KΩ	Inf.	6Ω	
V 11	25L6	Inf.	30Ω	†1.2KΩ	†1KΩ	1Meg	Inf.	23Ω	150Ω	
V 12	12AU7	14KΩ	940KΩ	0Ω	23Ω	23Ω	12KΩ	7Meg	0Ω	20Ω
V 13	12SN7	100KΩ	560KΩ 1.7Meg	168KΩ	4.7Meg	#1.8KΩ	650Ω 5.6KΩ	7Ω	0Ω	
V 14	12SN7	960KΩ	47KΩ	350KΩ	440KΩ	#35KΩ	0Ω	12Ω	7Ω	
V 15	25BQ6	Inf.	23Ω	4.7KΩ	5KΩ	390KΩ	4.7KΩ	12Ω	0Ω	TOP CAP #16Ω
V 16	6W4	Inf.	Inf.	120K Ω	Inf.	5KΩ	Inf.	#.4Ω	#0Ω	
V 17	1X2	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #800Ω
V 18	12WP4	70Ω	Inf.	.2Ω	Inf.	610KΩ	Inf.	Inf.	0Ω	Inf.

ALL MEASUREMENTS WITH PICTURE TUBE REMOVED
† MEASURED FROM OUTPUT OF M1
# MEASURED FROM PIN 3 OF V16

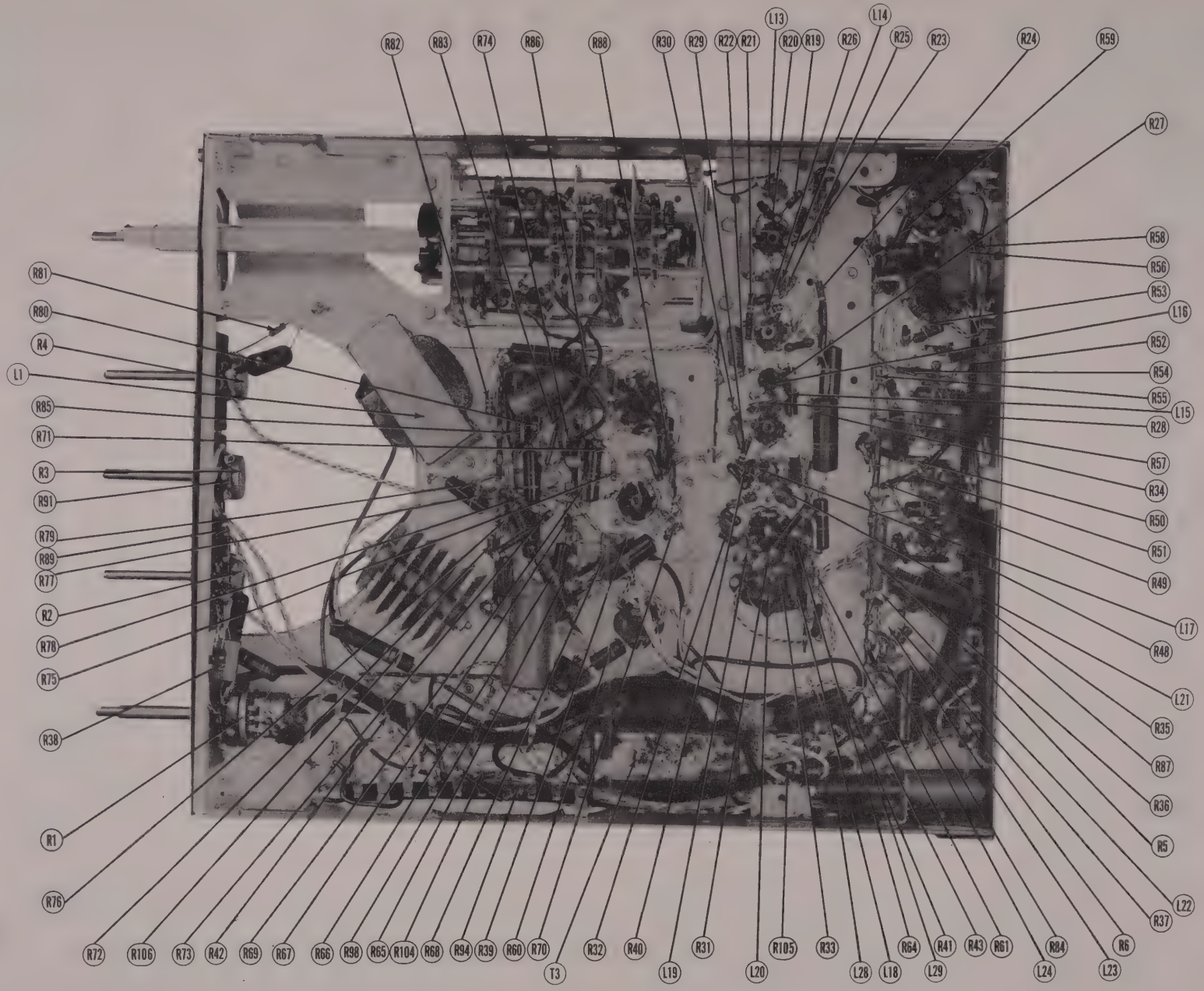
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



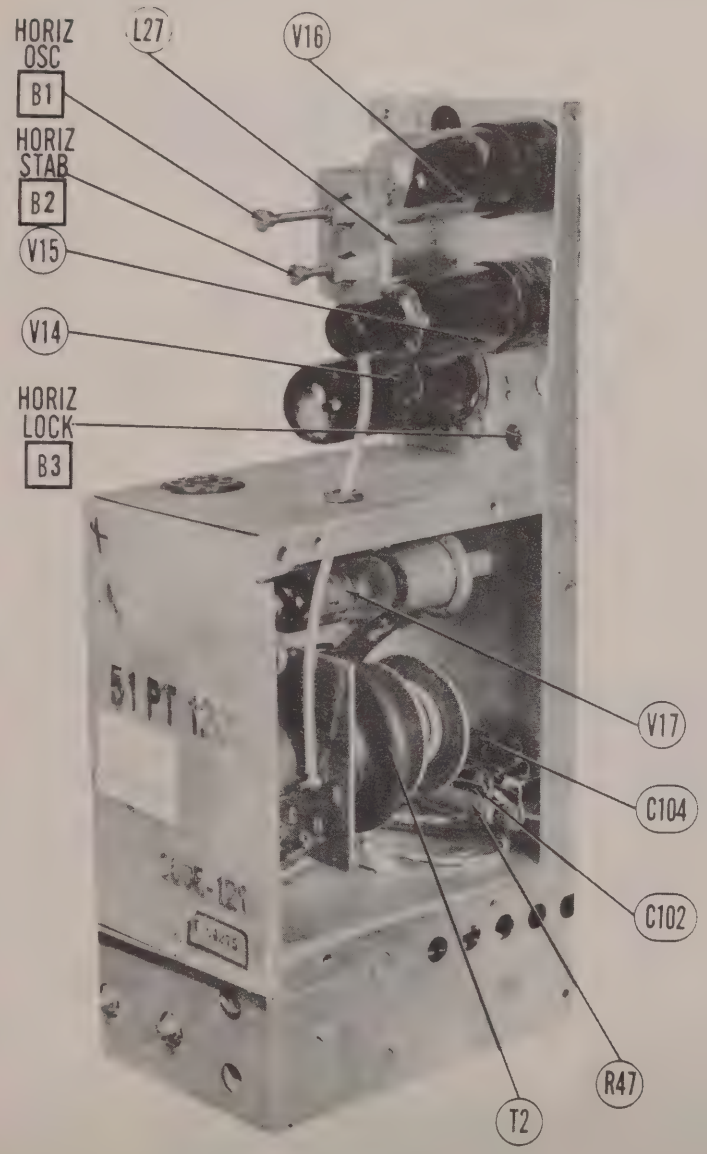
RF TUNER-RIGHT SIDE

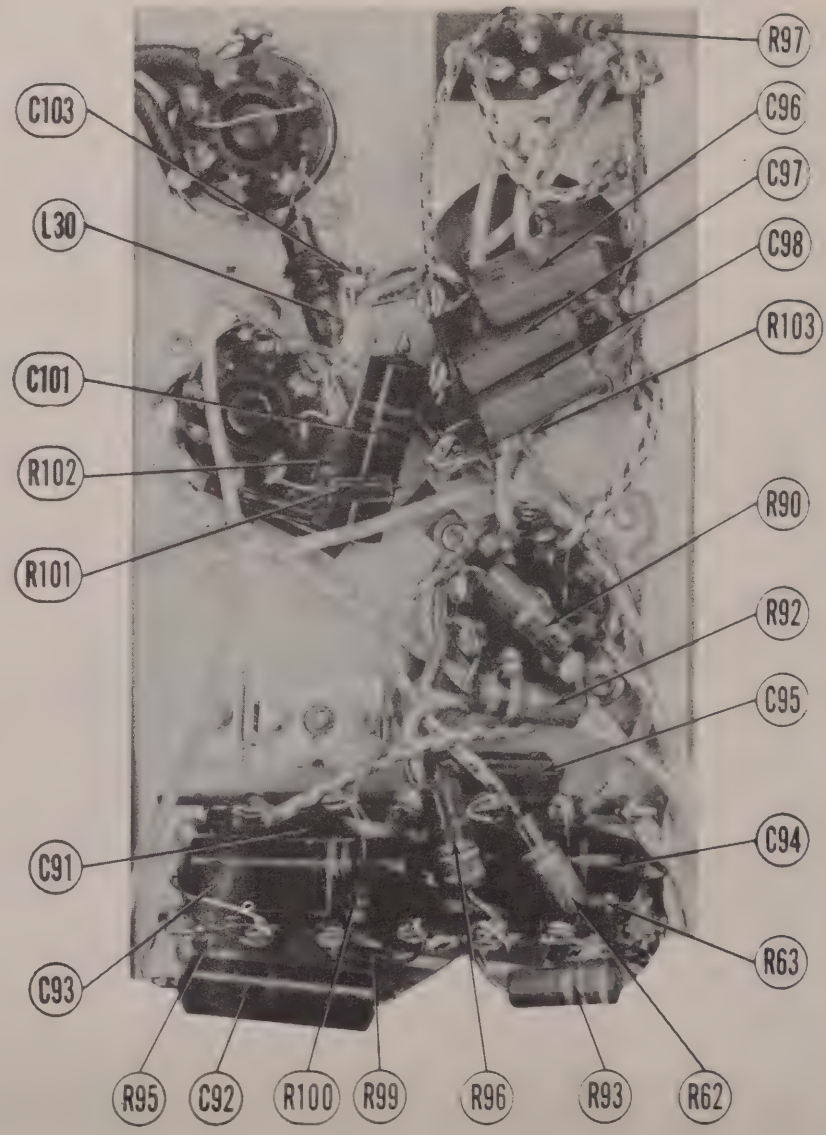


RF TUNER-LEFT SIDE

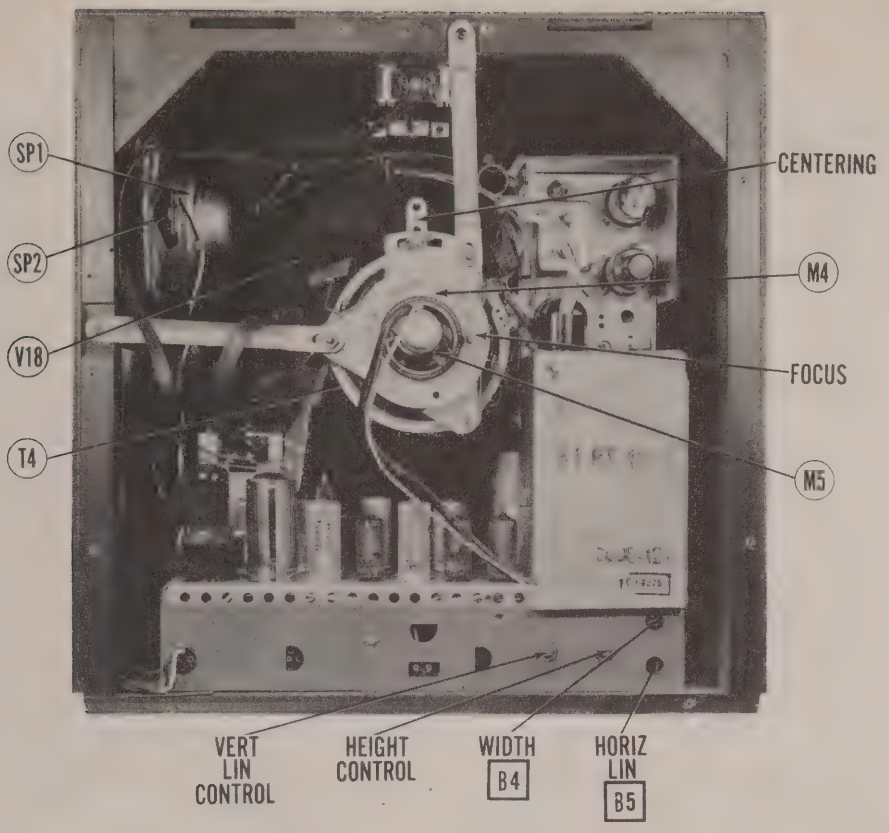


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION





HIGH VOLTAGE SUPPLY



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Pre-set the adjustments as follows:
Horizontal lock-in trimmer, (B3), one turn counter-clockwise from tight.
Horizontal stabilizing core, (B2), extending 5/6 inch above the coil mounting.
Horizontal hold control to the center of its range.
Turn the set on and tune in a TV station, preferably a test pattern.
Adjust the horizontal frequency slug, (B1), until the picture synchronizes horizontally.
Connect the vertical input lead of an oscilloscope thru a 33MMF capacitor to Pin 3 of the horizontal test socket.
Adjust the horizontal stabilizing core, (B2) until the broad and narrow peaks of the waveform on the scope are of equal height as shown in figure 6. If necessary adjust (B1) to keep the picture synchronized.
Note: In areas of moderately strong signals, free from noise, the tendancy of the oscillator to double trigger may be reduced by adjusting B2 so the rounded peak of the waveform is slightly higher than the pointed peak. Never adjust for more than a slight difference in the peaks, for to do so will render the oscillator too insensitive.
Remove the oscilloscope and turn the hold control to fully clockwise.
Adjust the lock-in trimmer, (B3), until there are four blanking bars sloping downward to the right.
Turn the horizontal hold control to fully counter-clockwise.
The picture should fall into sync and then out again.
Slowly turn the hold control clockwise and carefully note the least number of sloping bars just before the picture pulls into sync.
If more than 3 1/2 bars are present, adjust B3 slightly clockwise. If less than 2 1/2 bars are present adjust B3 slightly counter clockwise.
Turn the hold control to fully clockwise and adjust B1 until 4 sloping bars are present. If this adjustment is made before the set is thoroughly warmed up, adjust B1 for 2 sloping bars.
Repeat the check and adjustment of B1 and B3 until the proper conditions are obtained.
Adjust the width slug, (B4), until the picture fills the mask horizontally.
Adjust the horizontal linearity slug, (B5), until the picture is symmetrical from left to right.

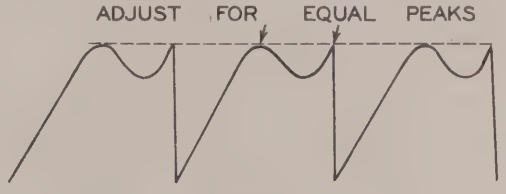


FIG. 6

DISASSEMBLY INSTRUCTIONS

1. Remove seven push-on type control knobs.
2. Remove eight wood screws from rear cover. Remove rear cover.
3. Disconnect built-in antenna.
4. Disconnect speaker.
5. Disconnect three ground clamps.
6. Remove four hex head bolts from chassis. Remove chassis.
7. Remove four hex nuts from speaker. Remove speaker

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6CB6	6CB6	6CK	
V2	Converter	12AV7	12AV7	7BT	
V3	1st Video IF Amp.	6CB6	6CB6	6CK	
V4	2nd Video IF Amp.	6CB6	6CB6	6CK	
V5	3rd Video IF Amp.	6CB6	6CB6	6CK	
V6	Video Detector - AGC Rectifier - Sync. Amplifier	12AU7	12AU7	9A	
V7	Video Amplifier	6AU6	6AU6	7BK	
V8	1st Sound IF Amp.	6AU6	6AU6	7BK	
V9	2nd Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector - AF Amplifier	7X7	7X7	8AC	
V11	Audio Output	25L6G	25L6G	7AC	
V12	Sync. Separator - Sync. Phase Inv.	12AU7	12AU7	9A	
V13	Vert. Mult. - Vert. Amplifier	12SN7GT	12SN7GT	8BD	
V14	Horiz. AFC - Horiz. Oscillator	12SN7GT	12SN7GT	8BD	
V15	Horiz. Output	25BQ6GT	25BQ6GT	6AM	
V16	Damper	6W4GT	6W4GT	4CG	
V17	HV Rectifier	1X2	1X2	7CB	
V18	Picture Tube	12WP4	12WP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	120	150	30-2570-86	E3A162		UPE15015		TVL-1428	Filter
C2A	20	300	30-3584-4	AF4G3016D4A		UPT430		TVA-1422	▲ Decoupling
B	150	150						TVL-4510	■ Filter
C	80	150							▲ Filter
C3	2	50	30-3417-7	E26E6		BBR2-50T		TVA-1301	Stabilizing Cap
C4	10	25		E26E117		BR102A		TVA-1204	Vert. Amp. Cathode
C5	470		62-147001021	SI470	D6-471		GP2K-471	19C15	Ant. Coupling
C6	470		62-147001021	SI470	D6-471		GP2K-471	19C15	Ant. Coupling
C7	20		62-02309011	SI20NPO	TCZ-20		NPOK-200		Fixed Trimmer
C8	39		62-03949011	SI39	D6-390		GP1K-390		RF Coupling
C9	10000			BPD-01	DD-103		821-01	36C1	AGC Filter
C10	220		30-1225-11	SI220	D6-221		GP2K-221	19C13	RF Amp. Dec.
C11	470		62-147001011	SI470	D6-471		GP2K-471	19C15	RF Amp. Screen
C12	220		30-1225-11	SI220	D6-221		GP2K-221	19C13	RF. Amp. Fil.
C13	3-3		31-6520-1		829-3				Variable Trimmer
C14	68		30-1221-11		TCZ-.68				RF Coupling
C15	220		30-1225-11	SI220	D6-221		GP2K-221	19C13	RF Coupling
C16	33		62-03300900l	SI33	D6-330		GP1K-330	19C24	RF Coupling
C17	1.2		30-1221-7						RF Coupling
C18	3.3		30-1221-9	SI3.3NPO	TCZ-3.3		NPOK-3R3		RF Coupling
C19	1.5-3		31-6520-1		829-3				Variable Trimmer
C20	1		30-1224-7		TCZ-1				Osc. Coupling
C21	10		30-1224-51	SI10N750	TCN-10		N750K-100	19C4	Osc. Grid Cap
C22	220		30-1225-1	SI220	D6-221		GP2K-221	19C13	Osc. Feedback
C23	1.5-3		31-6520-1		829-3				Variable Trimmer
C24	220		30-1225-11	SI220	D6-221		GP2K-221	19C13	Osc. Decoupling
C25	220		30-1225-11	SI220	D6-221		GP2K-221	19C13	Conv. Fil. Bypass
C26	1500			SI1500	D6-152		GP2L-152	29C8	Conv. Plate Dec.
C27	15		62-01540l001	SI15	D6-150		GP1K-150	19C22	Fixed Trimmer
C28	100			SI100	D6-101	5W5T1	GP1K-101	19C11	IF Coupling
C29	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	AGC Filter
C30	820	500		1468-001	D6-102	1W5T8	GP2L-102	1FM-21	1st V. IF Dec.
C31	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	1st V. IF Fil.
C32	150			SI150	D6-151	5W5T15	GP2K-151	19C12	IF Coupling
C33	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	AGC Filter
C34	820	500		1468-001	D6-102	1W5D1	GP2L-102	1FM-21	2nd V. IF Dec.
C35	1500			SI1500	D6-153	1W5D15	GP2L-152	29C8	2nd V. IF Fil.
C36	.15	200		P288-15		GT4P2		2TM-P15	AGC Filter
C37	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	3rd V. IF Plate Dec.
C38	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	3rd V. IF Screen
C39	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	3rd V. IF Cathode
C40	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	RF Bypass
C41	.1	200		P288-1	DF-104	PTE4P1		2TM-P1	RF Bypass
C42	33			SI33	D6-330	5W5Q3	GP1K-330	19C24	AGC Rect. Plate
C43	.1	200		P288-1	DF-104	PTE4P1		2TM-P1	AGC Filter
C44	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	AGC Filter
C45	10			SI10	D6-100	5W5Q1	GP1K-100	19C19	V. Det. Filter
C46	.15	200		P288-15		GT4P2		2TM-P15	Video Coupling
C47	820	500		1468-001	D6-102	1W5D1	GP2L-102	1FM-21	V. Amp. Cathode
C48	10			SI10N750	TCN-10		N750K-100	19C4	Fixed Trimmer
C49	.15	200		P288-15		GT4P2		2TM-P15	Video Coupling
C50	.01	400		P488-01	D6-103	PTE4S1	821-01	4TM-S1	Pic. Tube Grid
C51	560	500		1468-0005	D6-561	5W5T5	GP2K-561	1FM-35	Mtg. Frame Isolation *
C52	560	500		1468-0005	D6-561	5W5T5	GP2K-561	1FM-35	Mtg. Frame Isolation *
C53	560	500		1468-0005	D6-561	5W5T5	GP2K-561	1FM-35	Mtg. Frame Isolation *
C54	470			SI470	D6-471	5W5T5	GP2K-471	19C15	S. IF Coupling
C55	.0047	600		P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	1st S. IF Dec.
C56	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	1st S. IF Fil.
C57	22			SI22	D6-220	5W5Q2	GP1K-220	19C23	S. IF Coupling
C58	.0047	600		P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	2nd IF Dec.
C59	5			SI5	TCZ-4.7	5W5V5	GP1K-050	MS-55	Balancing
C60	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	RF Bypass
C61	150			SI150	D6-151	5W5T15	GP2K-151	19C12	Diode Load Cap
C62	220			SI220	D6-221	5W5T25	GP2K-221	19C13	RF Bypass
C63	.0033	400		P688-0033	D6-332	PTE6D3	GP2-333-332	6TM-D3	De-emphasis
C64	.01	400		P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C65	.01	400		P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C66	220			SI220	D6-221	5W5T25	GP2K-221	19C13	AF Amp. Plate *
C67	.01	400		P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C68	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	Ratio Det.-AF Fil.
C69	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	Ratio Det.-AF Fil.
C70	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	2nd S. IF Fil. *

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C71	220			SI220	D6-221	5W5T2	GP2L-221	19C13	Output Grid
C72	.0068	1000		P1068-0068	D6-682	PTE6D6	GP2-333-682	MB-D68	Output Plate
C73	.047	200		P268-047	DF-503	PTE4S5		2TM-S47	Sync. Coupling
C74	.01	400		P488-01	D6-103	PTE4S1	821-01	4TM-S1	Bias Filter
C75	.015	200		P268-015		PTE6S15		6TM-S15	Sync. Coupling
C76	220	500		SI220	D6-221	5W5T25	GP2K-221	19C13	Sync. Coupling
C77	.047	300		P268-047	DF-503	PTE4S5		2TM-S47	Sync. Coupling
C78	.0022	400		P688-0022	D6-222	PTE6D2	GP2-333-222	6TM-D22	Integrator Net
C79	.0047	600		P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Integrator Net
C80	.0047	600		P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Integrator Net
C81	.0022	400		P688-0022	D6-222	PTE6D2	GP2-333-222	6TM-D22	Vert. Osc. Grid
C82	.1	200		P288-1	DF-104	PTE4P1		2TM-P1	Vert. MV Cathode
C83	.033	400		P688-033		PTE6S3		6TM-S3	Vert. MV Feedback
C84	220	1000		SI220	D6-221	5W5T25	GP2K-221	19C13	Vert. MV Feedback †
C85	220	1000		SI220	D6-221	5W5T25	GP2K-221	19C13	Vert. MV Feedback †
C86	220	1000		SI220	D6-221	5W5T25	GP2K-221	19C13	Vert. MV Feedback †
C87	680	500		SI680	D6-681	1W5T7	GP2K-681	19C17	Vert. MV Feedback
C88	.068	400		P488-068				4TM-S68	Vert. Discharge
C89	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Vertical Shaping
C90	150	500		1468-0001S	D6-151	5W5T15	GP2K-151	1FM-35	Horiz. Sync. Coupling
C91	.0022	400		P688-0022	D6-222	PTE6D2	GP2-333-222	6TM-D22	Horiz. Sync. Coupling
C92	.022	200		P488-023	DF-303	PTE4S23		4TM-S23	AFC Filter
C93	.15	200		P288-15		GT4P2		2TM-P15	AFC Filter
C94	.047	400		P488-047	DF-503	PTE4S5		4TM-S47	Horiz. AFC Plate
C95	180	1000		1469-HV-0002					Horiz. Osc. Grid
C96	10000	500		1467-01		1D381		1FM-11	Fixed Trimmer
C97	820	500				1W5T8		MS-38	Horiz. Discharge
C98	1000	500		1467-001	D6-102	1W5D1	GP2L-102	1FM-21	Horiz. Sweep Coupling
C99	.47	400		684-5		GT4P5		4TM-P5	Horiz. Osc. Dec.
C100	.068	400		P488-068		PTE6S6		4TM-S68	Horiz. Output Screen
C101	.047	200		P288-047		PTE4S5		2TM-S47	Damper Filter
C102	.068	400		P488-068		PTE6S6		4TM-S68	Damper Filter
C103	2.2		30-1221-6		TCZ-2.2				Fixed Trimmer
C104	.047	400		P488-047	DF-503	PTE4S5		4TM-S47	Mtg. Frame Isolation
C105	1500			SI1500	D6-152	1W5D15	GP2L-152	29C8	Sync. Amp.-Sep. Fil.
C106	.01	600		P688-01	D6-103	PTE6S1	821-01	6TM-S1	Line Filter
C107	.01	600		P688-01	D6-103	PTE6S1	821-01	6TM-S1	Line Filter
C108	.01	600		P688-01	D6-103	PTE6S1	821-01	6TM-S1	V. Amp. Dec. *

* Not used in all models.
† Some models use 680MMF in place of items C 84, C85 and C86.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2500Ω	2	33-5563-29		RTV-267		Contrast Control - Wire Wound - Front
B	1Meg	½					Volume Control And SW - Rear
R2A	100KΩ	½	33-5565-24		AM-49-8		Brightness Control
B	Shaft		Not req.		RS-3/16 ∮		Attach to R2A Per Instructions
R3A	100KΩ	½	33-5565-24		AM-49-8		Horizontal Hold Control - See Note 1
B	Shaft		Not req.		RS-3/16 ∮		Attach to R3A Per Instructions
R4A	100KΩ	½	33-5565-24		AM-49-8		Vertical Hold Control - See Note 1
B	Shaft		Not req.		RS-3/16 ∮		Attach to R4A Per Instructions
R5A	5000Ω	½	33-5566-18	Q11-114	AG-19-B	AN-10	Vertical Linearity Control
B	Shaft		Not req.	RQ	FKS-1/4	AK-1	Attach to R5A Per Instructions
R6A	2.5Meg	½	33-5565-27	Q11-239	AG-84-8	AN-83	Height Control
B	Shaft		Not req.	RQ	FKS-1/4	AK-1	Attach to R6A Per Instructions

Note 1. Model 51-PT1282 uses a dual vertical and horizontal hold control having part number 33-5563-31.
∮ Fashion shaft to duplicate original.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R7	180Ω	½		BTS-1800	Antenna Loading - See Note 2
R8	1Meg 20%	½		BTS-1Meg	Antenna Isolation
R9	1Meg 20%	½		BTS-1Meg	Antenna Isolation
R10	1Meg 20%	½		BTS-1Meg	AGC Network
R11	4700Ω 20%	½		BTS-4700	RF Amp. Grid
R12	68000Ω	½		BTS-6800	RF Amp. Screen
R13	330Ω 20%	½		BTS-330	RF Amp. Decoupling
R14	100KΩ 20%	½		BTS-100K	Mixer Grid
R15	330Ω 20%	½		BTS-330	Mixer Plate Decoupling
R16	10KΩ	½		BTS-10K	Osc. Grid
R17	2200Ω 20%	½		BTS-2200	Osc. Plate Decoupling
R18	10KΩ	½			Mixer Grid Coil Shunt
R19	18KΩ	½			1st Video IF Amp. Grid
R20	39Ω	½			1st Video IF Amp. Cathode
R21	470Ω	½		BTS-470	1st Video IF Amp. Decoupling
R22	470Ω	½		BTS-470	Decoupling
R23	330Ω	½		BTS-330	AGC Network
R24	330Ω	½		BTS-330	AGC Network
R25	15KΩ	½		BTS-15K	2nd Video IF Amp. Grid
R26	47Ω	½			2nd Video IF Amp. Cathode
R27	8200Ω	½		BTS-8200	3rd Video IF Transformer Shunt
R28	180Ω	½		BTS-180	3rd Video IF Amp. Cathode
R29	2200Ω	½		BTS-2200	3rd Video IF Amp. Plate Decoupling
R30	470Ω	½		BTS-470	3rd Video IF Amp. Decoupling
R31	3300Ω	½		BTS-3300	Video Det. Diode Load
R32	470KΩ	½		BTS-470K	AGC Network
R33	100KΩ	½		BTS-100K	AGC Network
R34	100KΩ	½		BTS-100K	AGC Network
R35	1Meg	½		BTS-1Meg	Video Amp. Grid
R36	8200Ω 5%	2			Video Amp. Plate
R37	15KΩ	½		BTS-15K	Video Peaking Coil Shunt
R38	680Ω	½		BTS-680	Contrast Control Shunt
R39	47KΩ	½		BTS-47K	Voltage Divider
R40	33KΩ	½		BTS-330	Bias Network
R41	2.2Meg	½		BTS-2.2Meg	Bias Network - See Note 4
R42	68KΩ	½		BTS-68K	Voltage Divider
R43	820KΩ	½		BTS-820K	Picture Tube Cathode
R44	330KΩ 5%	1		BTA-330K-5%	Isolation - See Note 2
R45	330KΩ 5%	1		BTA-330K-5%	Isolation - See Note 2
R46	330KΩ 5%	1		BTA-330K-5%	Isolation - See Note 2

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
R47	100KΩ	2		BTB-100K	Isolation
R48	330KΩ	½		BTS-330K	1st Sound IF Amp. Grid
R49	1000Ω	½		BTS-1000	1st Sound IF Amp. Decoupling
R50	330KΩ	½		BTS-330K	2nd Sound IF Amp. Grid
R51	15KΩ	½		BTS-15K	2nd Sound IF Amp. Decoupling
R52	15KΩ	½		BTS-15K	Voltage Divider
R53	47KΩ	½		BTS-47K	Ratio Det. Diode Load
R54	330Ω	½		BTS-330	Balancing
R55	47KΩ	½		BTS-47K	De-emphasis
R56	4.7Meg	½		BTS-4.7Meg	AF Amp. Grid
R57	330KΩ	½		BTS-330K	AF Amp. Plate
R58	1Meg	½		BTS-1Meg	Output Grid
R59	150Ω	1		BW-1-150	Output Cathode - Wire Wound
R60	1000Ω	2		BTB-1000	Output Decoupling
R61	15KΩ	½		BTS-15K	Isolation
R62	820KΩ	½		BTA-820K	Bias Network
R63	22KΩ	½		BTS-22K	Bias Network
R64	470KΩ	½		BTS-470K -	Sync. Amp. Grid
R65	22KΩ	½		BTS-22K	Sync. Amp. Plate
R66	39KΩ	½		BTS-39K	Voltage Divider - See Note 5
R67	6.8Meg	½		BTS-6.8Meg	Horiz. Sync. Coupling
R68	270KΩ	½		BTS-270K	Sync. Sep. Grid
R69	56KΩ	½		BTS-56K	Sync. Sep. Plate
R70	15KΩ	½		BTS-15K	Voltage Divider
R71	4700Ω	½		BTS-4700	Sync. Phase Inv. Grid - See Note 6
R72	10KΩ	½		BTS-10K	Sync. Phase Inv. Plate - See Note 6
R73	4700Ω	½		BTS-4700	Sync. Phase Inv. Plate
R74	1Meg	½		BTS-1Meg	Bias Network
R75	22KΩ	½		BTS-22K	Voltage Divider
R76	22KΩ	½		BTS-22K	Integrator
R77	8200Ω	½		BTS-8200	Integrator
R78	8200Ω	½		BTS-8200	Integrator
R79	15KΩ	½		BTS-15K	Integrator
R80	100KΩ	½		BTS-100K	Vertical MV Grid
R81	75KΩ	½			Vertical MV Cathode - See Note 7
R82	470KΩ	½		BTS-470K	Vertical MV Plate
R83	100KΩ	½		BTS-100K	Vertical MV Feedback - See Note 8
R84	2.2Meg	½		BTS-2.2Meg	Voltage Divider
R85	6800Ω	½		BTS-6800	Vertical Peaking
R86	4.7Meg	½		BTS-4.7Meg	Vertical MV - Vertical Amp. Grid
R87	560Ω	½		BTS-560	Vertical MV- Vertical Amp. Cathode
R88	330KΩ 5%	1		BTA-330K-5%	Vertical Shaping
R89	47KΩ	½		BTS-47K	Voltage Divider
R90	2.7 Meg	½		BTA-2.7Meg	Voltage Divider
R91	82KΩ	½		BTS-82K	Horizontal Hold Control Shunt - See Note 3
R92	820KΩ	½		BTA-820K	Horizontal AFC Grid
R93	470KΩ	½		BTA-470K	Horizontal AFC Cathode
R94	56KΩ	½		BTS-56K	Horizontal AFC Plate
R95	8200Ω	½		BTS-8200	Horizontal AFC Filter
R96	470KΩ	1		BTA-470K	Horizontal Osc. Grid
R97	8200Ω	½		BTA-8200	Horizontal Osc. Coil Shunt
R98	10KΩ	½		BTS-10K	Horizontal Osc. Plate Decoupling
R99	22KΩ	½		BTS-22K	Horizontal Osc. Plate Decoupling
R100	150KΩ	½		BTS-150K	Horizontal Feedback
R101	100Ω 20%	½			Parasitic Suppressor
R102	180Ω	½			Parasitic Suppressor
R103	390KΩ	½		BTS-390K	Horizontal Output Grid
R104	1000Ω	½		BTS-1000	Decoupling
R105	6800Ω 20%	2		BTS-6800	Width Coil Shunt
R106	2.4Ω	2	66-9245240	BW-2-2.4	Surge Limiter - Wire Wound
R107A	200Ω	40	33-4535-3		Filament Dropping - Wire Wound
B	140Ω				Filament Dropping - Wire Wound
R108	100KΩ	½		BTS-100K	Series Test Jack - See Note 2

Note 2. Not used in all models.
Note 3. Not used in model 51-PT1282.
Note 4. Some models use 2.7 meg resistor in this application.
Note 5. Some models use 56KΩ resistor in this application.
Note 6. Some models use 8200Ω resistor in this application.
Note 7. Some models use 68KΩ resistor in this application.
Note 8. Some models use 47KΩ resistor in this application.

TRANSFORMER (FILAMENT)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 1.2A	6.3VAC @ 1.8A	6.3VAC @ 1.2A		32-8468			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	81Ω	0Ω	32-8466				Horizontal Output Trans.
	Taps 3Ω, 19Ω, 38Ω and 54Ω						
T3	1.5KΩ		32-8492		A-3037 ③		Vertical Output Trans.
	Tap 8Ω						
T4A	15Ω		32-9643				Horizontal Deflection Coil
B	70Ω						Vertical Deflection Coil

③ Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T5	2.3KΩ	3.4Ω	230Ω	.5Ω	32-8384-2 ① 32-8480 ②	A-3332	A-3025	RO-2 ③	① Used in models 51-PT1207, 51-PT1208 and 51-PT1234 ② Used in model 51-PT1282 ③ Drill one new mounting hole.

PHILCO MODELS 51-PT1207, 51-PT1208, 51-PT1234, 51-PT1282

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	PHILCO PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	3.4Ω	36-1639-1 ④ 36-1627-5 ⑤ 36-1626-1 ⑥	ST-803 Mod. P525-V	5A1	④ Used in model 51-PT1208 ⑤ Used in model 51-PT1207 ⑥ Used in models51-PT1234 ⑦ Used in model 51-PT1282
	CONE DIA.	V. C. DIA.	36-1631 ⑦			
SP2	5 1/8"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.250A	31Ω	1.7 Henries	32-8500	C-2326	C-2991 ③	TR-3300③	③ Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	
L2	Ant. Coil	.8Ω	.4Ω	76-6279		Part Number Includes L3
L3	Ant. Coil	.8Ω	.4Ω			
L4	FM Trap	0Ω		32-4438-1		
L5	Ant. Coils	0Ω		76-5774		Part Number Includes Switch Wafer And Coils
L6	RF Choke	0Ω		62-147001011		Part of C11
L7	RF Choke	.5Ω		32-4112-22		
L8	RF Coils	0Ω		76-5770		Part Number Includes Switch Wafer And Coils
L9	RF Choke	0Ω		32-4112-2		
L10	Mixer Grid Coils	0Ω		76-5772		Part Number Includes Switch Wafer And Coils
L11	Osc. Coils	0Ω		76-5768		Part Number Includes Switch Wafer And Coils
L12	Conv. Plate	.1Ω		32-4359-11		
L13	1st Video IF	.4Ω		32-4486-18		Tap .2Ω
L14	2nd Video IF	.3Ω		32-4486-9		
L15	Fil. Choke	.2Ω		32-4112-15		
L16	3rd Video IF	.3Ω	.3Ω	32-4486-12		
L17	4th Video IF	.6Ω	.3Ω	32-4486-17		
L18	Fil. Choke	.2Ω		32-4112-15		
L19	Peaking	4.6Ω		32-4480		180 Microhenries
L20	Peaking	2.3Ω		32-4143-16		40 Microhenries
L21	Peaking	2.5Ω		32-4480		70 Microhenries
L22	Peaking	.3Ω		32-4143-18		10 Microhenries
L23	Peaking	3.8Ω		32-4143-17		100 Microhenries
L24	Peaking	16Ω		32-4143-21		600 Microhenries
L25	1st Sound IF	5.5Ω		32-4449A		
L26	Ratio Det. Trans.	5.5Ω	.8Ω	32-4450		Tap 1.3Ω
L27	Horiz. Osc.	60Ω		32-4470-1		Tap 48Ω
L28	Horiz. Lin.	13Ω		32-4448-4		
L29	Width Coil	2.5Ω		32-4502-1		
L30	Damping Coil	.1Ω		32-4143-20		2.5 Microhenries

SELENIUM RECTIFIER

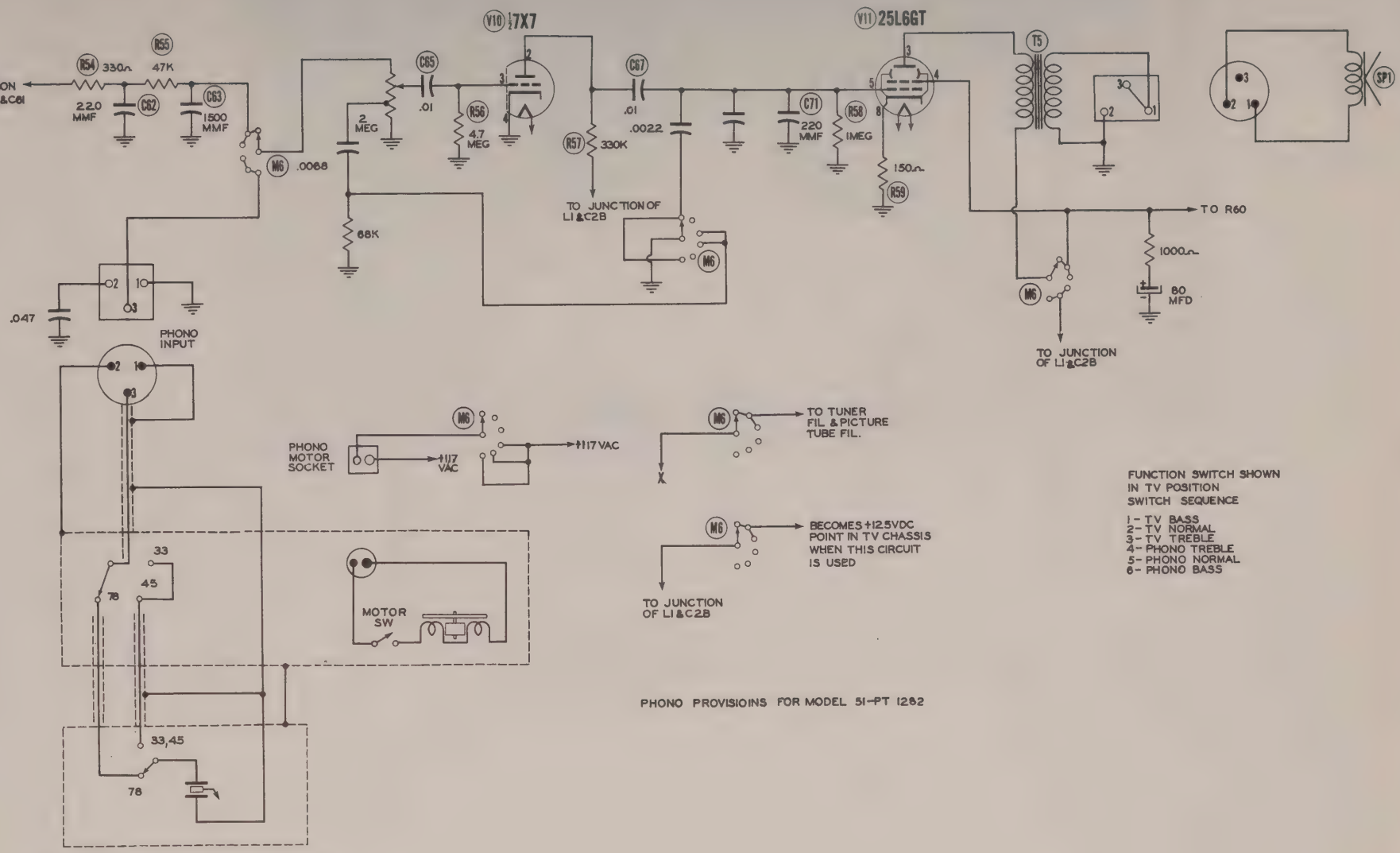
ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	PHILCO PART No.	SYLVANIA PART No.	SELETRON PART No.	
M1	.250A	34-8003-7	NH-5	6Q4	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			PHILCO PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M2	3AG Slo-Blo PigTail	1 1/4A	45-2656		315001 *		* Recommended Replacement 1 Amp. 3AG Slo-Blo PigTail

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M3	RF Tuner	76-5747-3	
M4	Focus Magnet	76-6126-5	
M5	Ion Trap	76-6240	
M6	Switch	42-1946	Function Selector (Model 51-PT1282 Only)
	Cabinet	10827	Model 51-PT1207
	Cabinet	10831	Model 51-PT1208
	Cabinet	10837	Model 51-PT1234
	Cabinet	10830	Model 51-PT1282
	Safety Glass	54-4835	Model 51-PT1207
	Safety Glass	54-4831	Model 51-PT1208
	Safety Glass	54-7943-19	Model 51-PT1234
	Safety Glass	54-7943-18	Model 51-PT1282
	Knob	54-4814	Brightness (Models 51-PT1207, 51-PT1208, 51-PT1234)
	Knob	76-6373	Brightness (Model 51-PT1282)
	Knob	76-6260	Channel Selector
	Knob	54-4801	Contrast
	Knob	54-4800	Fine Tuning
	Knob	54-4814	Horizontal Hold (Models 51-PT1207, 51-PT1208, 51-PT1234)
	Knob	54-4845	Horizontal Hold (Model 51-PT1282)
	Knob	54-4814	Vertical Hold (Models 51-PT1207, 51-PT1208, 51-PT1234)
	Knob	76-6372	Vertical Hold (Model 51-PT1282)
	Knob	56-8310FCP	Volume



PHONO PROVISIOINS FOR MODEL 51-PT 1282

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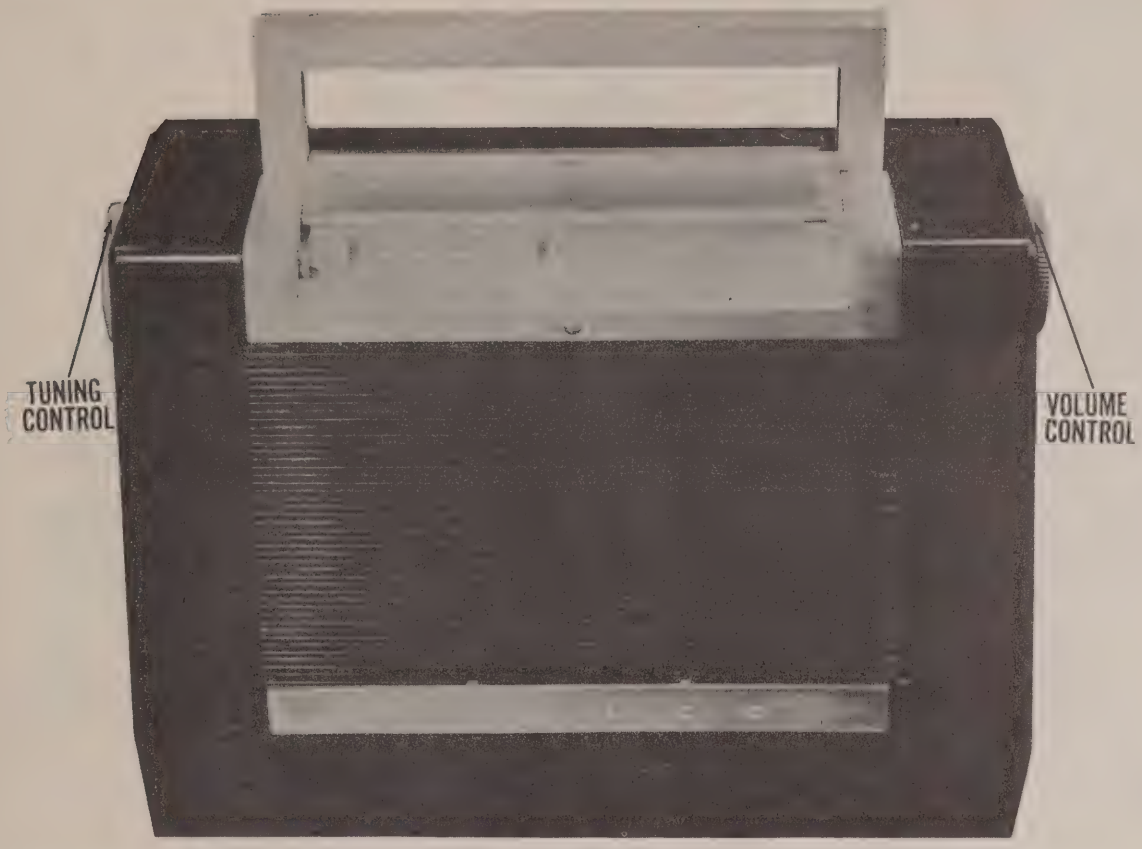
PHONO PROVISIONS-MODEL 51-PT1282

PHILCO
MODELS 51-629, 51-632



PHILCO
MODELS 51-629, 51-632

TRADE NAME	Philco, Model 51-629, 51-632
MANUFACTURER	Philco Corp., Tioga and "C" Sts., Philadelphia, Pa.
TYPE SET	Three Power Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (FOUR)	Types 1R5 Converter, 1U4 IF Amp., 1U5 DET.-AVC-AF, 3V4 Power Output
POWER SUPPLY	110-120 Volts AC-DC or 1.5 Volts "A" Supply and 90 Volts "B" Supply in Pack Form
RATING	.10 Amp. @ 117 Volts AC or 250MA @ 1.5 Volts DC and 14MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning gang fully closed and set pointer over the extreme right hand hole in chassis.
Use battery power if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator on ant. section of tuning gang. Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce modulation.
2.		Loop	1620KC	"	"	A4, A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	535KC	Tuning gang fully closed.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 2 & 3 until no further improvement can be made.

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PARTS LIST AND DESCRIPTIONS

PHILCO MODEL 51-629

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF	1U5	1U5	6BW	
V4	Power Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	50	150	30-2568-39	E3C235		UP64215		D13361	■ Filter
B	10	150							Filter
C	40	150							▲ Filter
C2	50	25	30-2417-12	PRS25/50		BR502A		TVA-1206	Filament Bypass
C3	.05	200	61-0122	P288-05	DF-503	PTE2S5		2TM-S5	AVC Filter
C4	47		62-051009001	SI47	D6-470	5W5Q5	GP1K-470	19C25	Osc. Grid Cap.
C5	7.5		30-1224-65						Fixed Trimmer
C6	1.5		30-1221-3	SI1.5NP0	TCZ-1.5		NP0K-1R5		Neutralizing
C7A	4000		30-1239	BPD-2X004	DD-2-502	1D5D4	822-004	36C2	Osc. Anode Dec.
B	4000					1D5D4			IF Grid Filter
C8	.22	100	45-3505-49	P185-25				68P19	Filament Bypass
C9A	1000		30-1237	BPD-001	DD-102	1W5D1	801-001	19C1	Audio Coupling
B	10000			BPD-01	DD-103	PTE4S1	821-01	36C1	AF Amp. Screen
C	2000			BPD-002	DD-202	PTE6D2	801-002	29C2	Audio Coupling
D	220			SI220	D6-221	5W5T25	GP2K-221	19C13	Output Grid
C10	2.2		30-1221-4		TCZ-2.2				Neutralizing
C11	.004	600	61-0179	P688-004	D6-402	PTE6D4	GP2-333-402	6TM-D4	Output Plate
C12	.1	400	61-0113	P488-1	DF-104	PTE4P1		72P52	Line Isolation
C13	.047	400	45-3505-45	P488-047	DF-503	PTE4S5		4TM-S47	Line Filter

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg	½	*33-5566-23	Q14-137	AG-61-S	B-68	Volume Control
B	Shaft		Not req.	Not req.	FS-3	Not req.	Attach to R1A per instructions

* Model 51-629 Uses Control and SW With Part # 33-5566-21

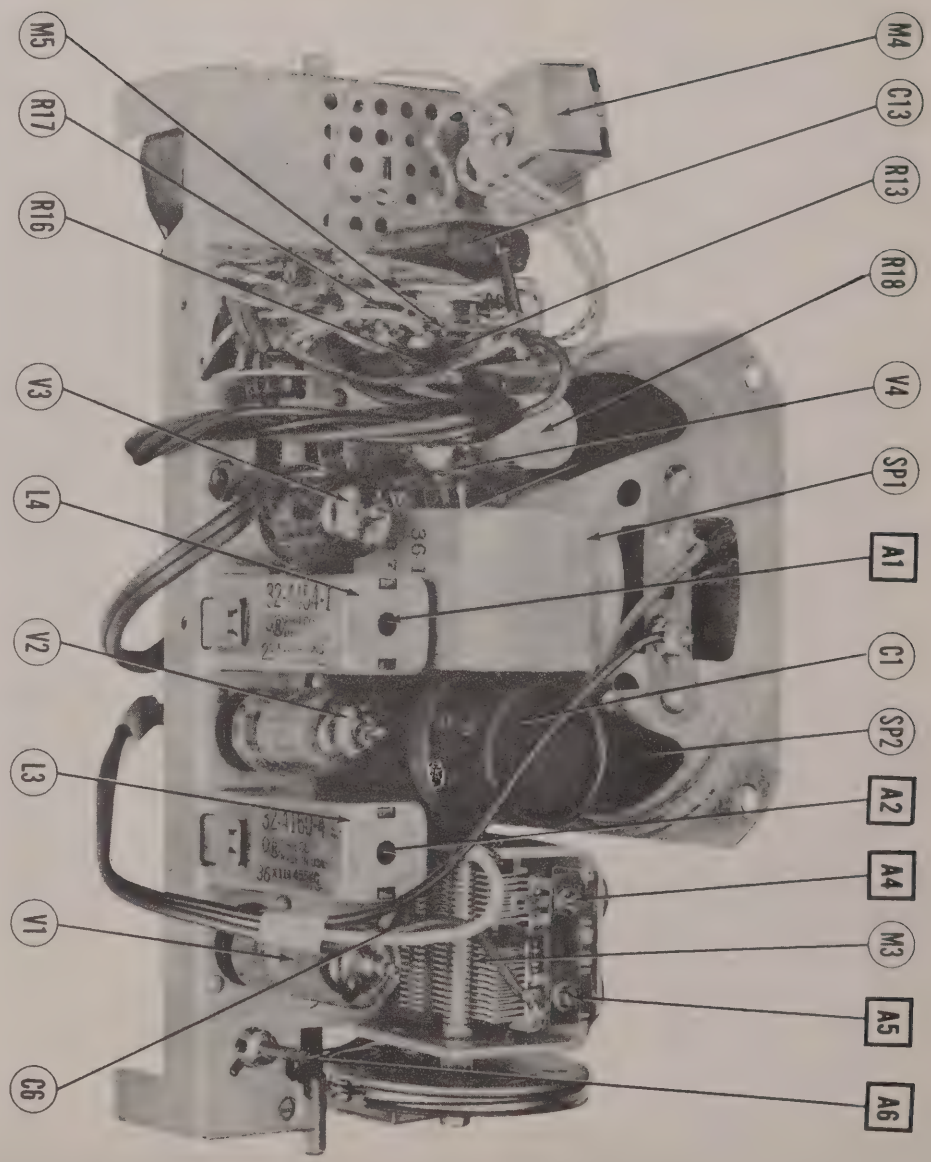
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
R2	3.3Meg	½	66-5338340	BTS-3.3Meg	AVC Network
R3	100KΩ	½	66-4108340	BTS-100K	Osc. Grid
R4	22KΩ	½	66-3228340	BTS-22K	Osc. Anode
R5	680Ω	½	66-1688340	BTS-680	Bias Network
R6	3.3Meg	½	66-5338340	BTS-3.3Meg	IF Amp. Grid
R7	2.2Meg	½	66-5228340	BTS-2.2Meg	AVC Network
R8	4.7Meg	½	66-5478340	BTS-4.7Meg	AF Amp. Grid
R9	4.7Meg	½	66-5478340	BTS-4.7Meg	AF Amp. Screen
R10	1Meg	½	66-5108340	BTS-1Meg	AF Amp. Plate
R11	2.2Meg	½	66-5228340	BTS-2.2Meg	Output Grid
R12	820Ω	½	66-1828340	BTS-820	Bias Network
R13	820Ω	½	66-1828340	BTS-820	Filter
R14	120Ω	1	33-1334-14		Surge Limiter - Wire Wound
R15	150KΩ	½	66-4158340	BTS-150K	Isolation
R16	330Ω	½	66-1338340	BTS-330	Bias Network
R17	1500Ω	½	66-2158340	BTS-1500	Filament String
R18A	1050	5	33-3445		Filament Dropping - Wire Wound
B	1050	5			Filament Dropping - Wire Wound

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	9KΩ	3.4Ω	440Ω	.6Ω	32-8434	A-3329			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: PHILCO PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST113		
SP1	PM	3.4Ω	36-1627-11	Model P4-X	4A1	
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: PHILCO PART No.	MEISSNER PART No.	
L1A	Loop Ant.	.1Ω	.8Ω	32-4455-1		Mod. 51-632
B	Loop Ant.			32-4052-52		Mod. 51-629
L2	Osc. Coil	2.7Ω	6.9Ω	32-4453		
L3	1st. IF Coil	26Ω	26Ω	32-4160-4A		
L4	2nd. IF Coil	32Ω	24Ω	32-4454-1A		

SELENIUM RECTIFIER

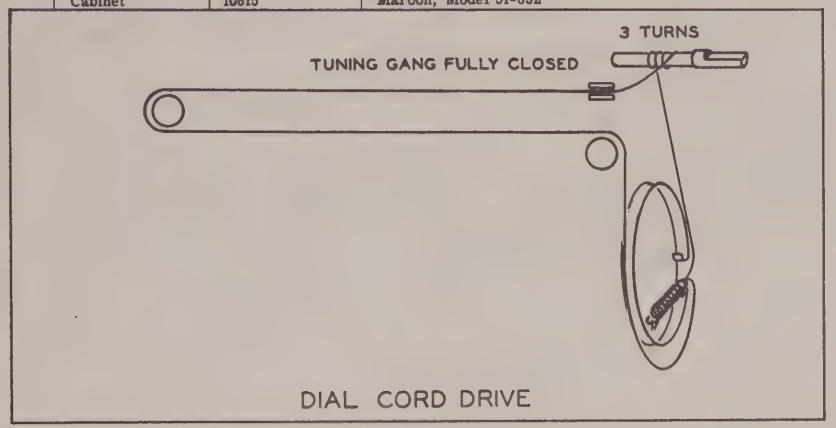
ITEM No.	RATING: CURRENT	REPLACEMENT DATA: PHILCO PART No.	SYLVANIA PART No.	SELETRON PART No.	NOTES
M1	.055A	34-8003.1	NB-5	5M4	

BATTERIES

ITEM No.	VOLTAGE	PART No.	REPLACEMENT DATA: EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M2	1.5V "A" 90V "B"	P-364						4TZ60	

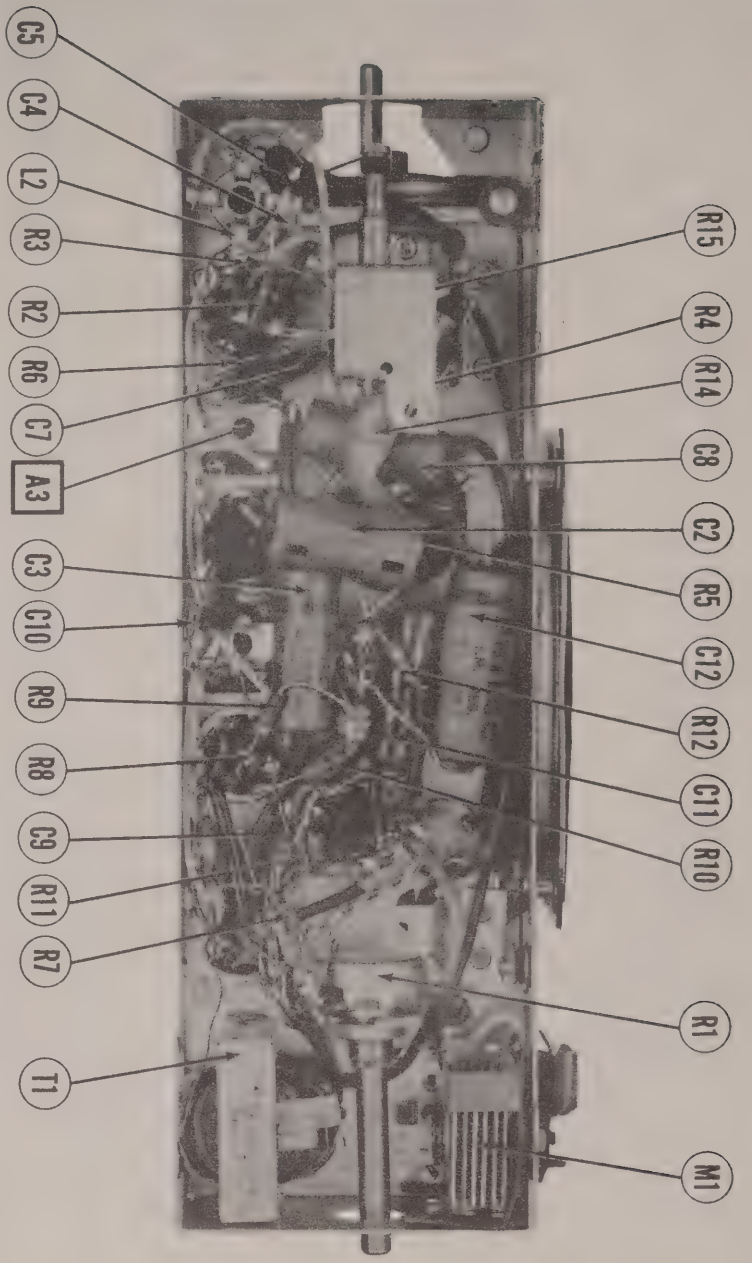
MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M3A	2 Gang Var. Cap.	31-2735-2	(22-351MMF, 14-152MMF)
B	2 Gang Var. Cap.	31-2735-3	Model 51-629
M4	Switch	42-1941	Model 51-632
M5	Switch	42-1925	Battery-Line
	Cabinet	10816	Maroon, Model 51-629
	Cabinet	10816-1	Green, Model 51-629
	Cabinet	10815	Maroon, Model 51-632

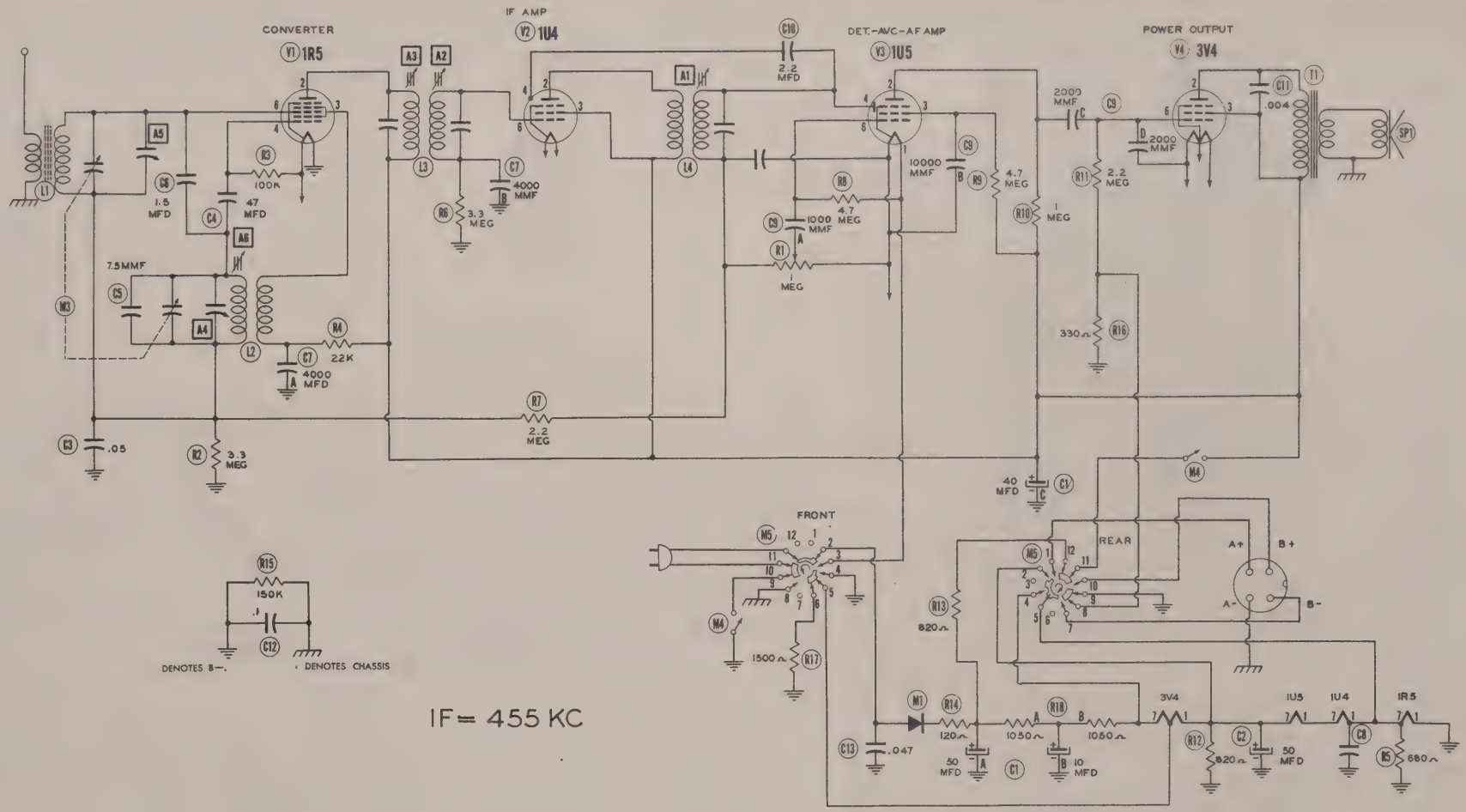


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



PHILCO MODEL 51-629



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0V	90VDC	45VDC	8-4.8VDC	0V	.2VDC	1.2VDC
V 2	1U4	1.2VDC	90VDC	9VDC	0V	1.2VDC	0V	2.4VDC
V 3	1U5	2.4VDC	15VDC	15VDC	.6VDC	0V	0V	3.6VDC
V 4	3V4	3.6VDC	85VDC	90VDC	0V	5VDC	0V	6.2VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†940Ω	†23KΩ	100KΩ	*	1.6Meg	*
V 2	1U4	*	†975Ω	†940Ω	Inf.	*	3.3Meg	*
V 3	1U5	*	†1Meg	†4.7Meg	1Meg	Inf.	4.7Meg	*
V 4	3V4	*	†1.3KΩ	†940Ω	0Ω	*	2.2Meg	*

§ TAKEN WITH VACUUM TUBE VOLTMETER

VOLTAGE MEASUREMENTS TAKEN IN AC-DC POSITION

† MEASURED FROM OUTPUT OF M1

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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136-13

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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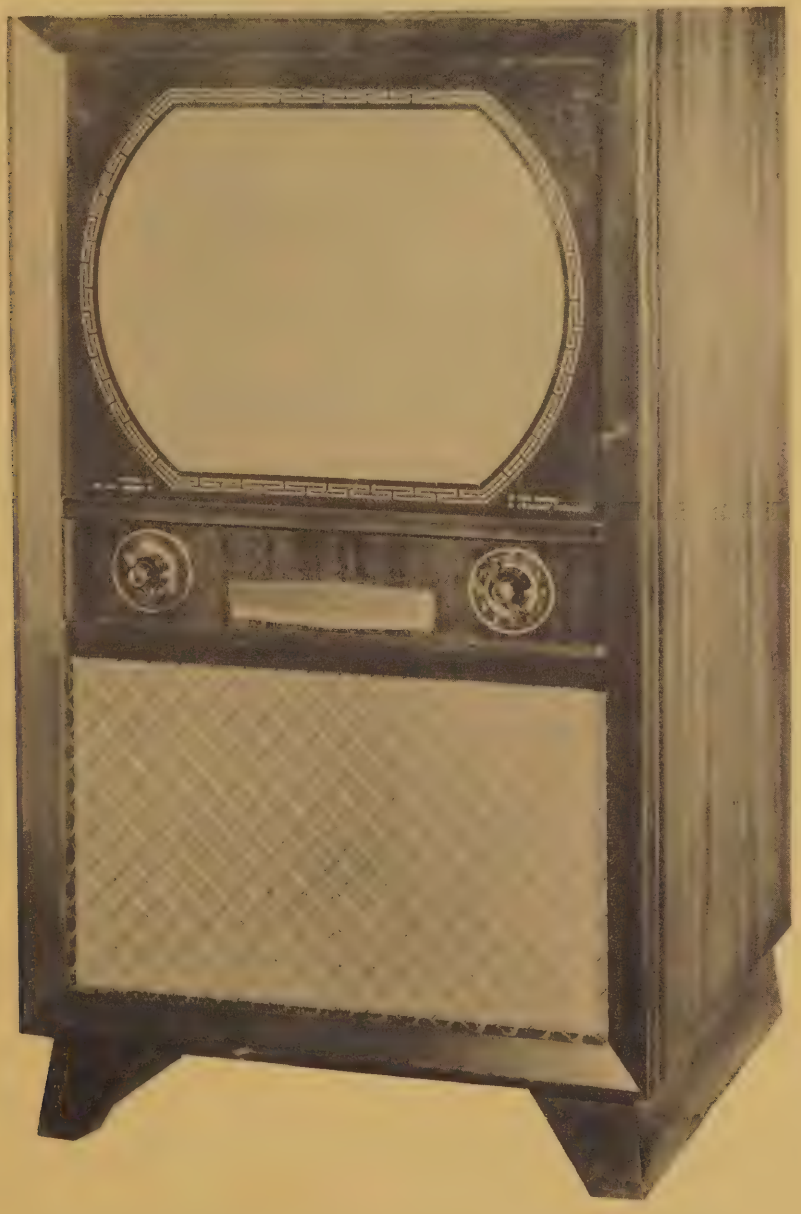

TRUETONE
MODEL 2D1089B

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

*"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."

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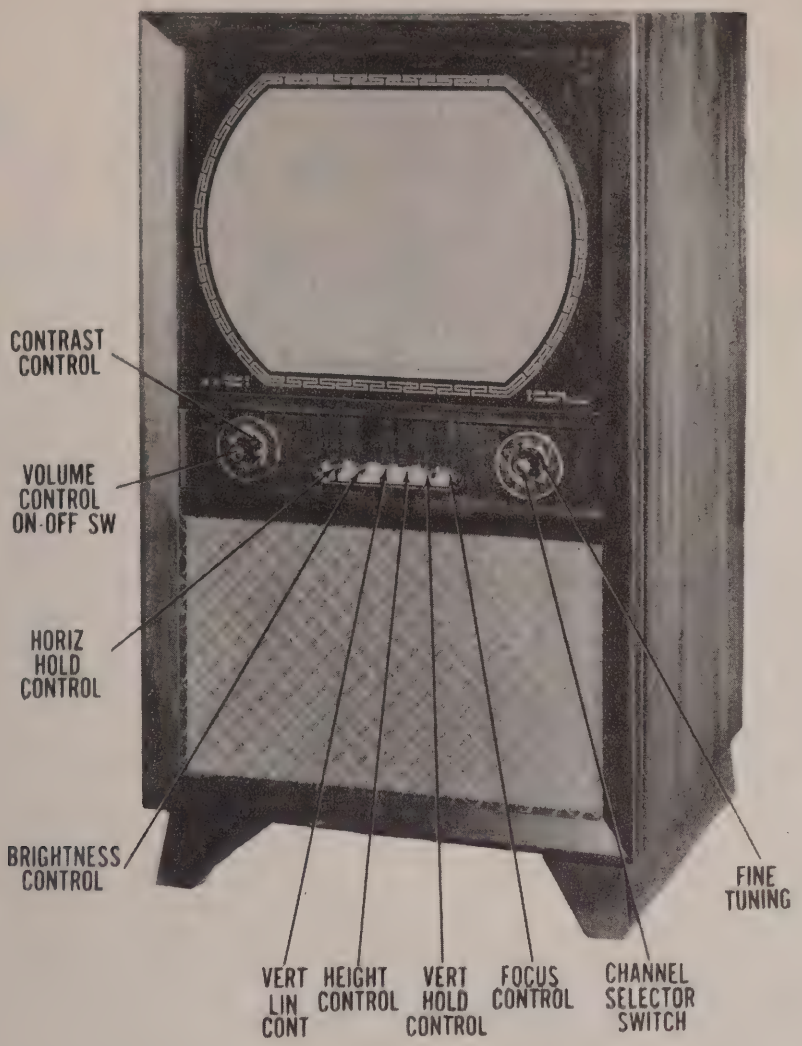

TRUETONE
MODEL 2D1089B

TRADE NAME	Truetone, Models 2D1089B (Factory No. 29T18-066)
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	Television Receiver
TUBES	Twenty Three
POWER SUPPLY	110-120 Volts AC - 60 Cycle
RATING	1.9 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13

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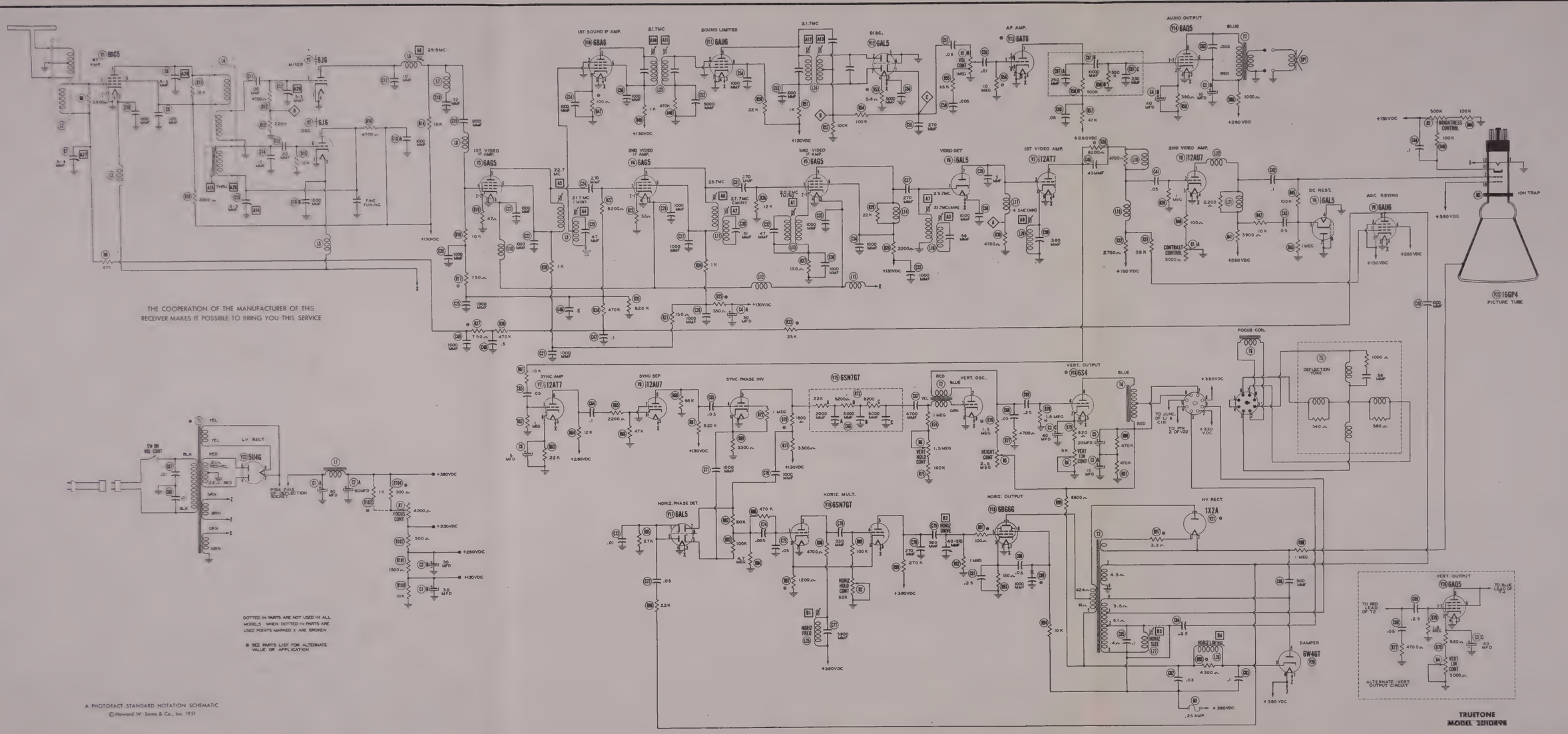
TRUETONE
MODEL 2D1089B
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
SEE PART'S LIST FOR ALTERNATE VALUE OR APPLICATION
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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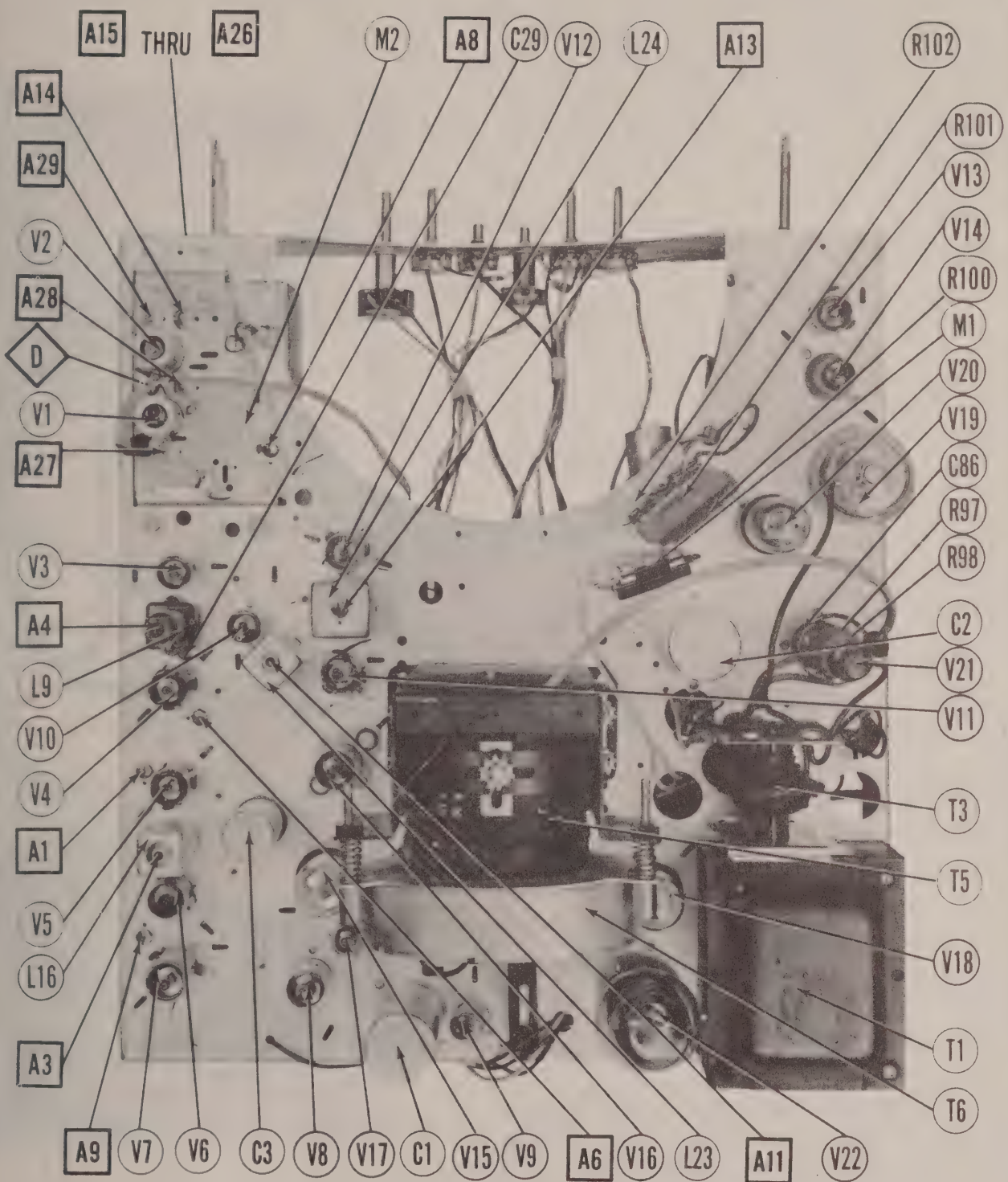
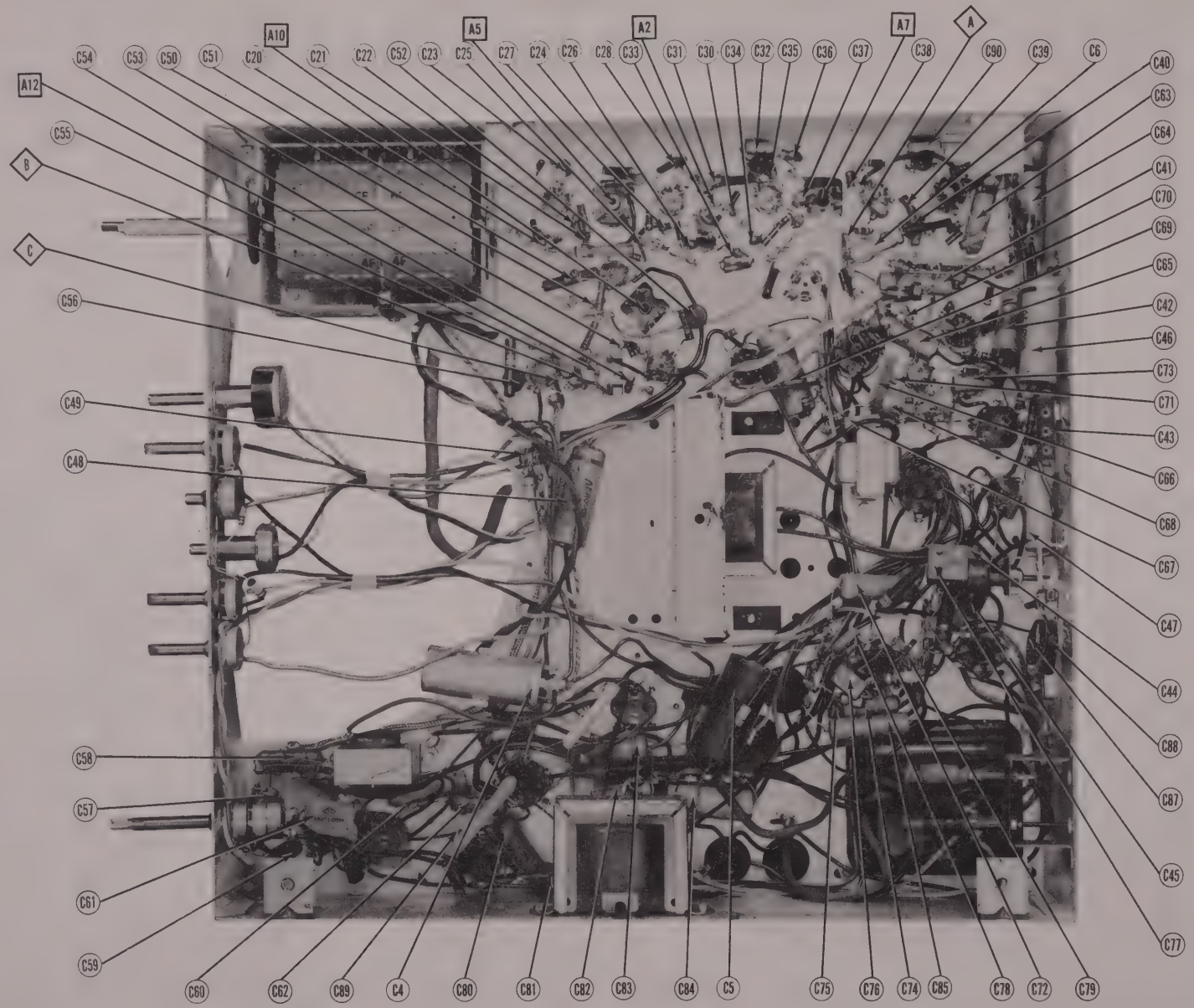
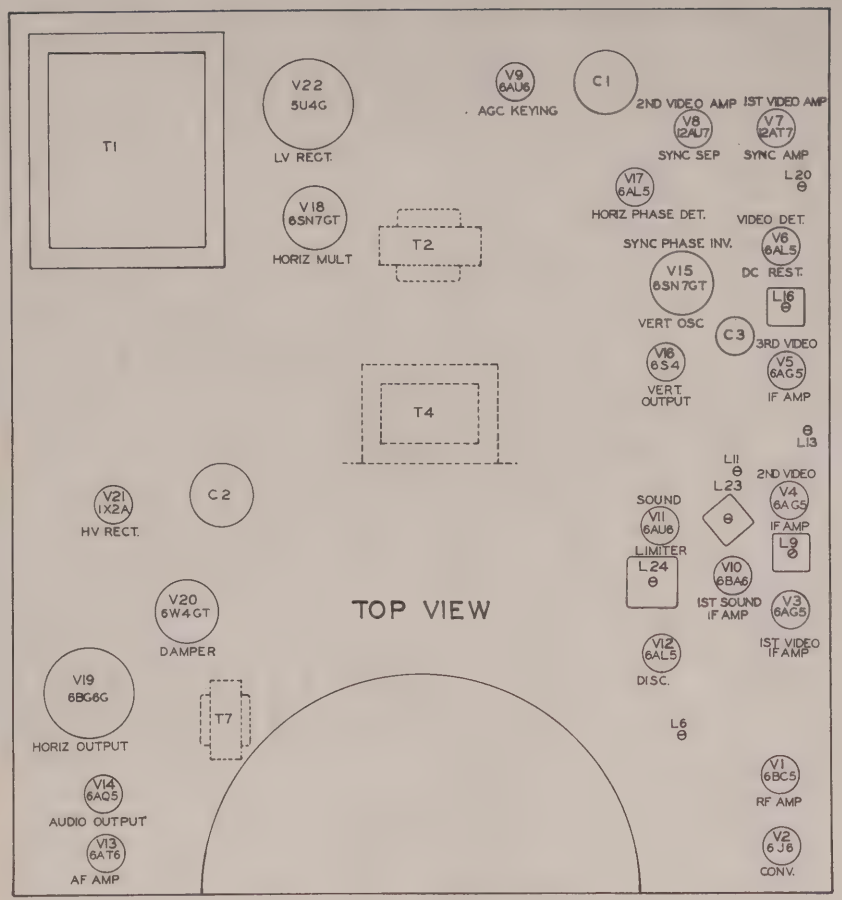
TRUETONE
MODEL 2D1089B

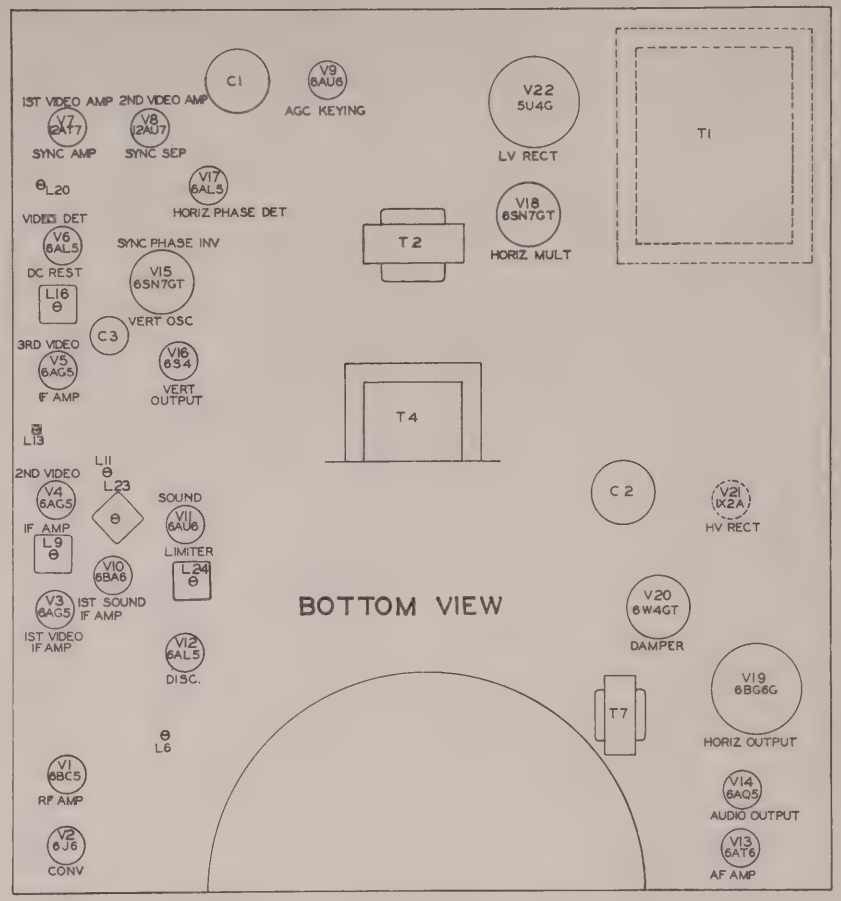


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

MODEL 2D1089B

TRUETONE

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube, (V2) and replace it with a 6J6 which has Pin 1 removed. This will disable the local oscillator and prevent the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	20.2MC (Unmod.)	Any	DC probe to Point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	27.7MC	"	"	A2	"
3.	"	"	21.7MC	"	"	A3, A4	"
4.	"	"	22.7MC	"	"	A5	Adjust for maximum deflection.
5.	"	"	25.7MC	"	"	A6	"
6.	"	"	23.7MC	"	"	A7	"
7.	"	"	25.5MC	"	"	A8	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative lead of a 3 volt battery to the ungrounded lead of C46, connect the positive lead to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	24MC (10MC SWP)	21.7MC 22.4MC 26.2MC	Any	Vert. amp. to Point (A). Low side to chassis.		Check for response curve similar to figure 1. If necessary retouch A5 thru A8 for proper response.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to Pin 2 (grid) of 12AT7, (V7). Low side to chassis.	Not used	4.5MC (400∿ Mod.)	Any	Vert. amp. to Pin 2 of picture tube. Low side to chassis.	A9	Adjust for MINIMUM 400∿ indication on scope.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	21.7MC (Unmod.)	Any	DC probe thru 1 meg to Point (B). Common to chassis.	A10, A11, A12	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to Point (C). Common to chassis.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	21.7MC (450KC SWP)	21.7MC	Any	Vert. amp. thru 22KΩ to Point (B). Low side to chassis.	A10, A11, A12	Adjust for maximum amplitude and symmetry as per figure 2.
11.	"	"	"	"	"	Vert. amp. to Point (C). Low side to chassis.	A13	Adjust A13 so 21.7MC occurs at center of cross over lines as per figure 3. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off-frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step, using A14. It should be noted that this is an all-channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A14 will not bring all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment for each channel that is off-frequency. The channel strip adjustment are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	215.75MC (Unmod.)	13	DC probe to Point (C). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
			209.75MC	12		A16	
			203.75MC	11		A17	
			197.75MC	10		A18	
			191.75MC	9		A19	
			185.75MC	8		A20	
			179.75MC	7		A21	
			87.75MC	6		A22	
			81.75MC	5		A23	
			71.75MC	4		A24	
			65.75MC	3		A25	
			59.75MC	2		A26	

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. amp. thru 10KΩ to Point ◇D◇. Low side to chassis.	A27, A28, A29	Adjust for response curve similar to figure 4 with markers above 90%.
13.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check all channels for response similar to figure 4. If markers fall below 70% on any channel make slight adjustments of A27, A28 and A29 with channel switch set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

FIG. 1

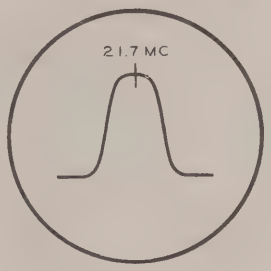


FIG. 2

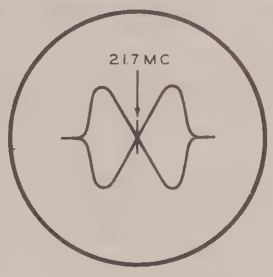


FIG. 3

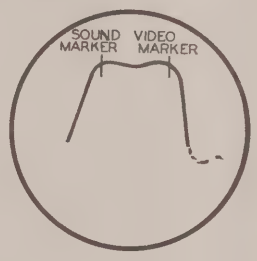


FIG. 4

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	-.7VDC	0V	6.3VAC	0V	105VDC	105VDC	0V		
V 2	6J6	105VDC	70VDC	6.3VAC	0V	-2VDC	-§4.4VDC	0V		
V 3	6AG5	-.3VDC	.4VDC	0V	6.3VAC	115VDC	115VDC	.4VDC		
V 4	6AG5	-.2VDC	.2VDC	6.3VAC	0V	117VDC	117VDC	.2VDC		
V 5	6AG5	0V	1VDC	6.3VAC	0V	112VDC	112VDC	1VDC		
V 6	6AL5	0V	0V	6.3VAC	0V	1VDC	0V	-.4VDC		
V 7	12AT7	95VDC	-.4VDC	0V	6.3VAC	6.3VAC	260VDC	0V	6.3VAC	0V
V 8	12AU7	250VDC	0V	12VDC	6.3VAC	6.3VAC	5.8VDC	0V	2VDC	0V
V 9	6AU6	117VDC	130VDC	0V	6.3VAC	-.2VDC	265VDC	130VDC		
V 10	6BA6	0V	0V	0V	6.3VAC	112VDC	112VDC	1.6VDC		
V 11	6AU6	-.5VDC	0V	6.3VAC	0V	112VDC	85VDC	0V		
V 12	6AL5	-.1VDC	-.5VDC	6.3VAC	1.4VAC	0V	0V	-.5VDC		
V 13	6AT6	-.5VDC	0V	0V	6.3VAC	-1.7VDC	-1.7VDC	60VDC		
V 14	6AQ5	0V	13.5VDC	6.3VAC	0V	225VDC	240VDC	0V		
V 15	6SN7GT	-20VDC	140VDC 270VDC	0V	.6VDC	105VDC	16VDC	0V	6.3VAC	
V 16	6S4	0V	15VDC 40VDC	0V	0V	6.3VAC	0V	0V	0V	580VDC
V 17	6AL5	0V	0V	6.3VAC	0V	5.7VDC	0V	-3.6VDC		
V 18	6SN7GT	.4VDC	330VDC	12VDC	-4.7VDC	137VDC	12VDC	0V	6.3VAC	
V 19	6BG6G	-3.8VDC	6.3VAC	10VDC	0V	-3.8VDC	0V	0V	270VDC	*
V 20	6W4GT	0V	340VDC	600VDC	230VDC	380VDC	230VDC	380VDC	380VDC	
V 21	1X2A	* DO NOT MEASURE								
V 22	5U4G	0V	390VDC	0V	380VAC	0V	380VAC	125VDC	390VDC	
V 23	16GP4	0V	.4VDC	PIN 10 380VDC	PIN 11 125VDC	PIN 12 6.3VAC				

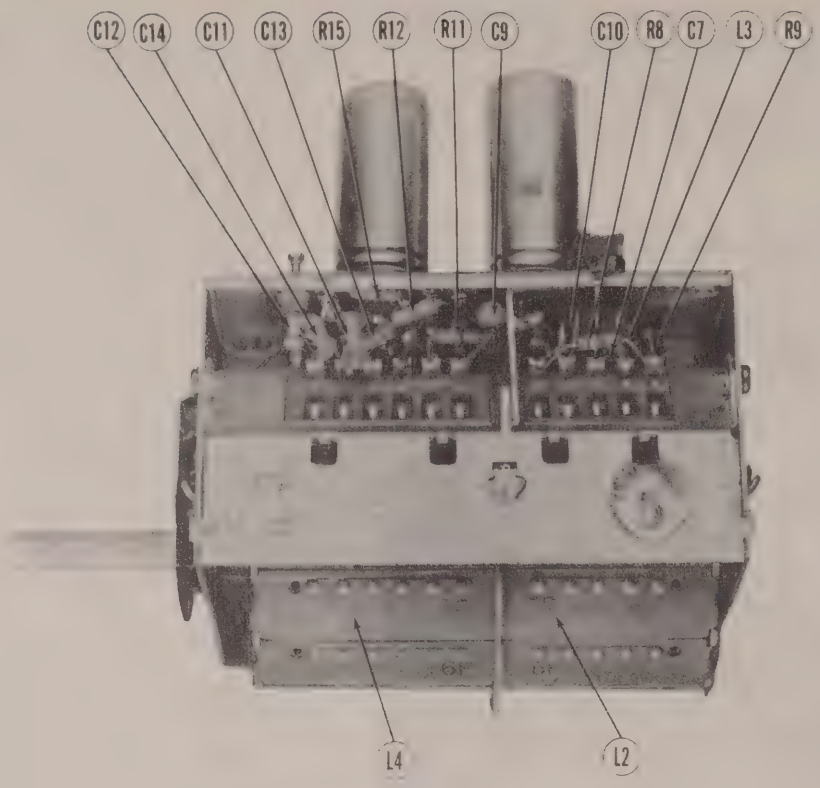
ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
* DO NOT MEASURE
§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

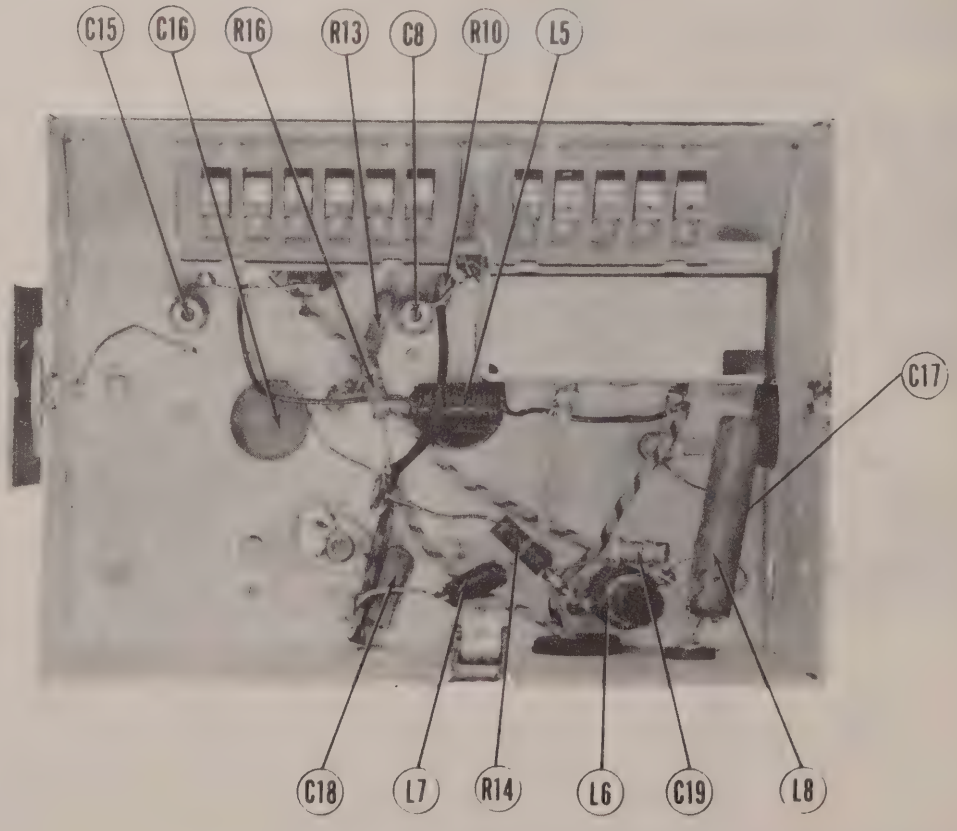
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	2Meg	0Ω	.1Ω	0Ω	†4.6KΩ	†4.6KΩ	0Ω		
V 2	6J6	†7.2KΩ	†20KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6AG5	900KΩ	50Ω	0Ω	.1Ω	†3.9KΩ	†3.9KΩ	50Ω		
V 4	6AG5	900KΩ	33Ω	.1Ω	0Ω	†3.6KΩ	†3.6KΩ	33Ω		
V 5	6AG5	12KΩ	150Ω	.1Ω	0Ω	†4.7KΩ	†4.7KΩ	150Ω		
V 6	6AL5	.1Ω	0Ω	.1Ω	0Ω	1Meg	0Ω	4.7KΩ		
V 7	12AT7	†11KΩ	4.7KΩ	.2Ω	.1Ω	.1Ω	†15KΩ	1Meg	20KΩ	0Ω
V 8	12AU7	†5KΩ	1Meg	3KΩ	.1Ω	.1Ω	†82KΩ	0Ω	50KΩ	0Ω
V 9	6AU6	†40KΩ	†2.4KΩ	0Ω	.1Ω	1.4Meg	†900Ω	†2.4KΩ		
V 10	6BA6	0Ω	0Ω	0Ω	.1Ω	†3.3KΩ	†3.3KΩ	100Ω		
V 11	6AU6	470KΩ	0Ω	.1Ω	0Ω	†3.3KΩ	†26KΩ	0Ω		
V 12	6AL5	200KΩ	100KΩ	.1Ω	2Ω	0Ω	0Ω	100KΩ		
V 13	6AT6	10Meg	0Ω	0Ω	.1Ω	Inf.	Inf.	†580KΩ		
V 14	6AQ5	470KΩ	400Ω	.1Ω	0Ω	†2.4KΩ	†1.8KΩ	470KΩ		
V 15	6SN7GT	3Meg	#3.2 Meg 1.2Meg	0Ω	1Meg	†7.2KΩ	3.3KΩ	0Ω	.1Ω	
V 16	6S4	Inf.	5.8KΩ 820Ω	2Meg	0Ω	.1Ω	2Meg	Inf.	Inf.	#8KΩ
V 17	6AL5	27KΩ	27KΩ	.1Ω	0Ω	4.7Meg	Inf.	4.7Meg		
V 18	6SN7GT	5Meg	†5.2KΩ	1.2KΩ	150KΩ	†270KΩ	1.2KΩ	0Ω	.1Ω	
V 19	6BG6G	1Meg	.1Ω	150Ω	Inf.	1Meg	Inf.	0Ω	†10KΩ	TOP CAP #90Ω
V 20	6W4GT	Inf.	12KΩ	550KΩ	12KΩ	†650Ω	12KΩ	†50Ω	†50Ω	
V 21	1X2A	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #540Ω
V 22	5U4G	Inf.	12KΩ	Inf.	22Ω	Inf.	21Ω	90KΩ	12KΩ	
V 23	16GP4	0Ω	1.3Meg	PIN 10 †50Ω	PIN 11 100KΩ	PIN 12 .1Ω				

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
† MEASURED FROM PIN 2 OF V22
# MEASURED FROM PIN 3 OF V20

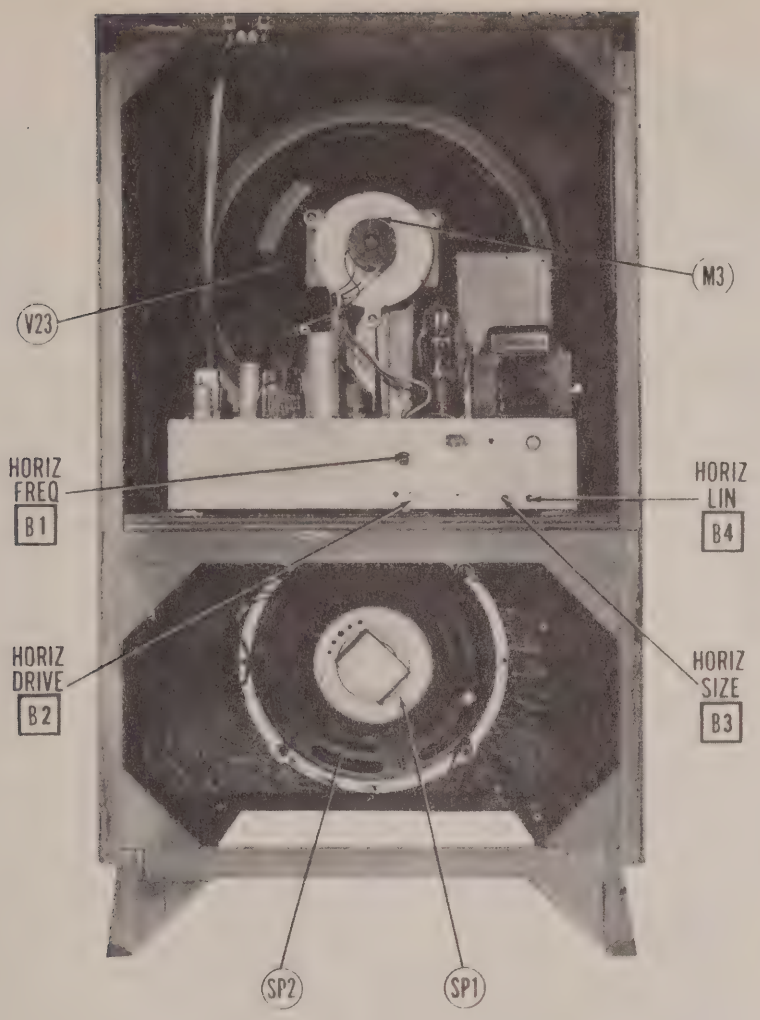
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer, (B2), counter-clockwise as far as possible without crowding or vertical lines appearing in the picture.

Adjust the horizontal size slug, (B3), until the picture fills the mask horizontally.

Adjust the horizontal linearity slug, (B4), until the picture is symmetrical from left to right. Slight readjustment of B2 may be necessary to obtain optimum linearity.

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove six wood screws from rear cover. Remove rear cover.
3. Disconnect built-in antenna.
4. Remove antenna terminal strip.
5. Disconnect speaker.
6. Remove four hex head bolts from chassis. Remove chassis.
7. Remove four hex nuts from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL, IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6BC5	6BC5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF Amp.	6AG5	6AG5	7BD	
V4	2nd Video IF Amp.	6AG5	6AG5	7BD	
V5	3rd Video IF Amp.	6AG5	6AG5	7BD	
V6	Video Detector - DC Restorer	6AL5	6AL5	6BT	
V7	1st Video Amp. - Sync. Amplifier	12AT7	12AT7	9A	
V8	2nd Video Amp. - Sync. Separator	12AU7	12AU7	9A	
V9	AGC Keying	6AU6	6AU6	7BK	
V10	1st Sound IF Amp.	6BA6	6BA6	7BK	
V11	Sound Limiter	6AU6	6AU6	7BK	
V12	Discriminator	6AL5	6AL5	6BT	
V13A	AF Amplifier	6AT6	6AT6	7BT	
B	AF Amplifier	6AV6	6AV6	7BT	
V14	Audio Output	6AQ5	6AQ5	7BZ	
V15	Sync. Phase Inv. - Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V16A	Vertical Output	6B4	6B4	9AC	
B	Vertical Output	6AQ5	6AQ5	7BZ	
V17	Horiz. Phase Det.	6AL5	6AL5	6BT	
V18	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V19	Horiz. Output	6BG6G	6BG6G	6AM	
V20	Damper	5W4GT	5W4GT	4CG	
V21A	H.V. Rectifier	1X2A	1X2A	7CB	
B	H.V. Rectifier	1X2	1X2	7CB	
V22	L.V. Rectifier	5U4G	5U4G	5T	
V23	Picture Tube	16GP4	16GP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	80	450	45X376	AF166J		UP8445		TVL-2777	▲ Filter
B	30	450							▲ Filter
C2A	80	450	45X376	AF166J		UP8445		TVL-2777	▲ Filter
B	30	450							▲ Filter
V3A	10	450	45X375	AF223B8		UPT1145V4		TVL-3749	■ Vert. Output Dec.
B	10	450							▲ Output Decoupling
C	40	50							Vert. Output Cathode
C4A	30	450	45X380	AFH6J		UP2145V5		TVL-3751	■ Filter
B	40	50		PRS50/50					▲ Output Cathode
C5	20	400	45X382	PRS450/20		BR2045A		TVA-1709	Vert. Output Dec.
C6	5	25	45X378	PRS150/4		BBR5-25		TVA-1203	Sync. Amp. Cathode
C7	3-9								Variable Trimmer
C8	.5-3				829-3				Variable Trimmer
C9	120			SI120	D6-121		GP2K-121	19C29	RF Amp. Dec.
C10	1000			BPD-00I	DD-102		80I-00I	19C1	RF Amp. Fil.
C11	100			SI100N750	TCN-100		N750L-101	29C16	RF Coupling
C12	.5-3				829-3				Variable Trimmer
C13	20			SI30NPO	TCZ-20		NPOK-200		Osc. Grid Cap
C14	10			SI10N750	TCN-10		N750K-100	19C4	Fixed Trimmer
C15	.5-3				829-3				Variable Trimmer
C16A	1000			BPD-2X00I	DD-2-102		812-00I	29C7	RF Bypass
B	1000								Conv. Filament
C17	10			SI10NPO	TCZ-10		NPOK-100	19C3	Fixed Trimmer
C18	72	500							Fixed Trimmer
C19	300			SI300	D6-301		GP2K-301	19C31	IF Coupling
C20	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	AGC Filter
C21	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	RF Bypass
C22	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	1st V. IF Dec.
C23	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	1st V. IF Fil.
C24	270	500	47X445	1468-00025	D6-271	5W5T25	GP2K-271	1FM-325	IF Coupling
C25	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	AGC Filter
C26	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	RF Bypass
C27	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	2nd V. IF Dec.
C28	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	2nd V. IF Fil.
C29	47				TCZ-47		NPO-330-470	29C14	Fixed Trimmer
C30	51				TCZ-51		NPO-330-510		Fixed Trimmer
C31	270	500	47X445	1468-00025	D6-271	5W5T25	GP2K-271	1FM-325	IF Coupling
C32	47	500		1469-00005	TCZ-47	5R5Q5	NPO-330-470	29C14	Fixed Trimmer
C33	1000		47X519	SI1000	D6-102	1W5DI	GP2L-00I	19C1	RF Bypass
C34	1000		47X519	SI1000	D6-102	1W5DI	GP2L-00I	19C1	3rd V. IF Dec.
C35	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	3rd V. IF Fil.
C36	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	3rd V. IF Cathode
C37	270	500	47X445	1468-00025	D6-271	5W5T25	GP2K-271	1FM-325	IF Coupling
C38	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	V. Det. Fil.
C39	5		47X562	SI5NPO	TCZ-4.7	5W5V5	NPOK-5	MS-55	V. Diode Filter
C40	43		47X563		TCZ-43		NPOL-430		Peaking
C41	.05	400	D67503		P488-05		PTE4S5		4TM-S5 Video Coupling
C42	.1	600	F65104		P688-1		DF-104	PTE6P1	6TM-P1 Video Coupling
C43	.05	400	D67503		P488-05		DF-503	PTE4S5	4TM-S5 Video Coupling
C44	.1	200	B65104		P288-1		DF-104	PTE4P1	2TM-P1 Picture Tube Cath.
C45	1000	1000	47X569		1464-HV-00I				Horiz. Sweep Coupling
C46	.5	200	B65504		P288-5			GT2P5	2TM-P5 AGC Filter
C47	.1	200	B65104		P288-1		DF-104	PTE4P1	2TM-P1 AGC Filter
C48	.5	200	B65504		P288-5			GT2P5	2TM-P5 AGC Filter
C49	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	AGC Filter
C50	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	1st S. IF Dec.
C51	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	1st S. IF Cathode
C52	5000		47X507	BPD-005	DD-502	1D5D5	811-005	29C1	Limiter Grid Filter
C53	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	Limiter Plate Dec.
C54	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	Limiter Screen
C55	270	500	47X445	1468-00025	D6-271	5W5T25	GP2K-271	1FM-325	RF Bypass
C56	5000		47X507	BPD-005	DD-502	1D5D5	811-005	29C1	Discr. Filament
C57	.05	200	B65503		P288-05	DF-503	PTE4S5		2TM-S5 Audio Coupling
C58	.005	200	B65502		P688-005	D6-502	PTE6D5	811-005	6TM-D5 Tone Comp.
C59	.01	200	B65103		P488-01	D6-103	PTE4S1	821-01	4TM-S1 Audio Coupling
C60	.05	400	D67503		P488-05	DF-503	PTE4S5		4TM-S5 AF Amp. Plate Dec.

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C61A	250		*76X5	SI250	*	5W5T25	GP2K-251	19C13	AF Amp. Plate Dec.
B	10000			BPD-01	PC-80	PTE4S1	821-01	36C1	Audio Coupling
C	250			SI250		5W5T25	GP2K-251	19C13	Output Grid
C62	.005	600	F65502	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Output Plate
C63	.05	400	D67503	P488-05	DF-503	PTE4S5		4TM-S5	Sync. Coupling
C64	.1	400	D65104	P488-1	DF-104	PTE4P1		4TM-P1	Sync. Coupling
C65	.05	400	D67503	P488-05	DF-503	PTE4S5		4TM-S5	Sync. Coupling
C66A	2000		† 76X7	P688-002	†	PTE6D2	GP2-333-202	6TM-D2	Integrator Net
B	5000			P688-005	PC-100	PTE6D5	GP2-333-502	6TM-D5	Integrator Net
C	5000			P688-005		PTE6D5	GP2-333-502	6TM-D5	Integrator Net
C67	4700	500	47X543	1467-005	D6-472	1D5D5	GP2-333-472	1FM-25	Vert. Osc. Grid
C68	.05	600	F65503	P688-05	DF-503	PTE6S5		6TM-S5	Vert. Discharge
C69	.25	400	D65254	P488-25		GT4P25		4TM-P25	Vert. Sweep Coupling
C70	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	Horiz. Sync. Coupling
C71	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	Horiz. Sync. Coupling
C72	.05	600	F67503	P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Feedback
C73	.01	200	B65103	P488-01	D6-103	PTE4S1	821-01	4TM-S1	AFC Filter
C74	.005	600	B65502	P688-005	D6-502	PTE6D5	811-005	6TM-D5	AFC Filter
C75	.05	200	B65503	P288-05	DF-503	PTE4S5		2TM-S5	AFC Filter
C76	330	500	47X570	1468-00035	D6-331	5W5T3	GP2K-331	1FM-335	Horiz. MV Feedback
C77	3900	500	47X572	1464-004		1DR5D4		MS-24	Fixed Trimmer
C78	270	500	47X445	SI270	D6-271		GP2K-271	19C31	Horiz. Discharge
C79	390	500	47X571	1468-0004	D6-391	5W5T4	GP2K-391	1FM-34	Horiz. Sweep Coupling
C80	.05	600	F67503	P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Output Screen
C81	.25	200	B65254	P488-25		GT2P25		2TM-P25	Horiz. Output Cathode
C82	.03	400	D65303	P688-03		PTE6S3		6TM-S3	Damper Filter
C83	.1	400	D65104	P488-1		PTE4P1		4TM-P1	Damper Filter
C84	.25	200	B65254	P488-25		GT2P25		2TM-P25	Horiz. Sweep Coupling
C85	.1	200	D65104	P288-1	DF-104	PTE4P1		2TM-P1	Fixed Trimmer
C86	500	2000	47X560	HV20C	TV3-502				H.V. Filter
C87	.01	400	46X410	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Line Filter
C88	.01	400	46X410	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Line Filter
C89	1000		47X519	SI1000	D6-102	1W5DI	GP2L-102	19C1	Horiz. Output Screen ‡
C90	360		47X568						Fixed Trimmer

* Items C61A, C61B, C61C, R58A and R58B are combined into one unit.
† Items C66A, C66B, C66C, R73A, †73B and R73C are combined into one unit.
‡ Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	3000Ω	½	78X4	Concentrikit			
B	1Meg	½		B17-114 # ¶	RTV-218	SBBT-503-S	Contrast Control - Front
				B13-137X #			Volume Control And SW - Tapped ⑤ 200KΩ - Rear
C	Shaft End			E-202 #			Attach Per Instructions in "Concentrikit"
R2A	50KΩ	½	40X292	Q11-123	AG-44-S	B-31	Horizontal Hold Control
B	Shaft		Not req.	Not req.	KSS-3	Not req.	Attach to R2A Per Instructions
R3A	500KΩ	½	40X290	Q11-133	AG-58-S	B-59	Brightness Control
B	Shaft		Not req.	Not req.	KSS-3	Not req.	Attach to R3A Per Instructions
R4A	5000Ω	½	40X294	Q11-114	AG-19-S		Vertical Linearity Control
B	Shaft		Not req.	PQ ¶	RS-2		Attach to R4A Per Instructions
C	Bushing		Not req.	S-3 §	59-186		Attach to R4A Per Instructions
R5A	2.5Meg	½	40X293	Q11-239	AG-84-S	B-83 ¶	Height Control
B	Shaft		Not req.	RQ	FKS-1/4	Not req.	Attach to R5A Per Instructions
R6A	1.5Meg	½	40X291	Q11-138	AG-83-S	B-75	Vertical Hold Control
B	Shaft		Not req.	Not req.	KSS-3	Not req.	Attach to R6A Per Instructions
R7A	4000Ω	2	40X304		43-4000		Focus Control - Wire Wound
B	Bushing		Not req.		59-186		Attach to R7A Per Instructions

¶ Fashion shaft to duplicate original.
§ Cut bushing to correct length.
# Shunt the terminals which are used on this replacement with an 8200Ω resistor.
‡ Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R8	3900Ω	½		BTS-3900	Antenna Coil Shunt
R9	47KΩ 20%	½		BTS-47K	AGC Network
R10	2200Ω 20%	½		BTS-2200	RF Amp. Decoupling
R11	10KΩ	½		BTS-10K	RF Coil Shunt
R12	4700Ω 20%	½		BTS-4700	Mixer Grid
R13	220KΩ 20%	½		BTS-220K	Mixer Grid
R14	15KΩ	½			Mixer Plate
R15	10KΩ	½		BTS-10K	Osc. Grid
R16	4700Ω	½		BTS-4700	Osc. Plate
R17	750Ω 20%	1		BTA-820	AGC Network - See Note 2
R18	10KΩ	½	B64103		1st. Video IF Amp. Grid
R19	47Ω 5%	½	B63470		1st. Video IF Amp. Cathode
R20	1000Ω 5%	½	B64102	BTS-1000-5%	1st. Video IF Amp. Decoupling
R21	150Ω	½	B64151	BTS-150	1st. Video IF Amp. Decoupling
R22	8200Ω 5%	½	B63822		2nd. Video IF Amp. Grid
R23	33Ω 5%	½	B63330		2nd. Video IF Amp. Cathode
R24	1000Ω 20%	½	B64102	BTS-1000	2nd. Video IF Amp. Decoupling
R25	330Ω	½	B64331	BTS-330	Decoupling - See Note 14
R26	12KΩ 5%	½	B63123		3rd. Video IF Amp. Grid
R27	150Ω	½	B64151	BTS-150	3rd. Video IF Amp. Cathode
R28	2200Ω	½	B64222	BTS-2200	3rd. Video IF Amp. Decoupling
R29	22KΩ	½	B64223	BTS-22K	Plate Choke Shunt
R30	4700Ω	½	B64472	BTS-4700	Video Det. Diode Load
R31	33KΩ	½	B64333	BTS-33K	AGC Keying Grid
R32	2700Ω 5%	1	C83272	BTA-2700-5%	Voltage Divider
R33	33KΩ	½	B64333	BTS-33K	AGC Network - See Note 3
R34	470KΩ	½	B64474	BTS-470K	AGC Network
R35	820KΩ	½	B64824	BTS-820K	AGC Network
R36	470KΩ 20%	½	B65474	BTS-470K	AGC Network
R37	750Ω	½		BTS-820	AGC Network - See Note 2
R38	8200Ω	1		BTA-5600	1st. Video Amp. Plate - See Note 4
R39	1Meg	½	B64105	BTS-1Meg	2nd. Video Amp. Grid
R40	100Ω	½	B64101	BTS-100	2nd. Video Amp. Cathode
R41	3900Ω 5%	1	C83392	BTA-3900-5%	2nd. Video Amp. Plate
R42	10KΩ	½	B64103	BTS-10K	Isolation

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	IDENTIFICATION CODES
R43	1Meg	½	B64105	BTS-1Meg	DC Restorer Diode Load
R44	100KΩ 20%	½	B65104	BTS-100K	Voltage Divider
R45	100KΩ	½	B64104	BTS-100K	Picture Tube Grid
R46	100KΩ 20%	½	B65104	BTS-100K	Picture Tube Cathode
R47	100Ω	1	C84101	BW-1-100	Sound IF Amp. Cathode - Wire Wound-See Note 5
R48	1000Ω	½	B64102	BTS-1000	Sound IF Amp. Decoupling
R49	470KΩ	½	B64474	BTS-470K	Limiter Grid
R50	22KΩ	½	B64223	BTS-22K	Limiter Screen
R51	1000Ω	½	B64102	BTS-1000	Limiter Plate Decoupling
R52	100KΩ	½	B64104	BTS-100K	Disc. Diode Load
R53	5.6Ω	1		BW-1-5.6	Disc. Diode Filament - Wire Wound - See Note 6
R54	100KΩ	½	B64104	BTS-100K	De-emphasis
R55	68KΩ	½	B64683	BTS-68K	Tone Compensation
R56	10Meg	½	B85106	BTS-10Meg	AF Amp. Grid - See Note 13
R57	47KΩ	½	B64473	BTS-47K	AF Amp. Plate Decoupling
R58A	500KΩ	½	76X5 *	BTS-470K	AF Amp. Plate
B	500KΩ	½		BTS-470K	Output Grid
R59	390Ω	2	D84391	BW-2-390	Output Cathode - Wire Wound
R60	1000 Ω	2	D84102	BTB-1000	Output Decoupling
R61	10KΩ	½	B64103	BTS-10K	Isolation
R62	1Meg	½	B64105	BTS-1Meg	Sync. Amp. Grid
R63	22KΩ 20%	½	B64223	BTS-22K	Sync. Amp. Cathode
R64	12KΩ 5%	½	B63123	BTS-12K-5%	Sync. Amp. Plate
R65	2200Ω	½	B64222	BTS-2200	Isolation
R66	47KΩ 5%	½	B63473	BTS-47K-5%	Sync. Sep. Cathode
R65	820KΩ	½	B64824	BTS-820K	Sync. Sep. Plate
R68	68KΩ	½	B64683	BTS-68K	Voltage Divider
R69	3300Ω 5%	½	B63332	BTS-3300-5%	Sync. Phase Inv. Cathode
R70	1600Ω 20%	½		BTS-1500	Sync. Phase Inv. Plate - See Note2
R71	3300Ω 5%	½	B63332	BTS-3300-5%	Sync. Phase Inv. Plate
R72	1Meg	½	B64105	BTS-1Meg	Voltage Divider
R73A	22KΩ	½	76X7 †	BTS-22K	Integrator
B	8200Ω	½		BTS-8200	Integrator
C	8200Ω	½		BTS-8200	Integrator
R74	1Meg	½	B64105	BTS-1Meg	Vert. Osc. Grid
R75	100KΩ	½	B64104	BTS-100K	Vert. Osc. Grid
R76	1.5Meg 20%	½	B85155	BTS-1.5Meg	Vert. Osc. Plate - See Note 7
R77	4700Ω	½	B64472	BTS-4700	Vert. Peaking
R78	1.8Meg	½	B64185	BTS-1.8Meg	Vert. Output Grid
R79	820Ω	½	B64821	BTS-820	Vert. Output Cathode
R80	470KΩ 20%	½	B85474	BTS-470K	Bleeder
R81	470KΩ	½	B64474	BTS-470K	Bleeder
R82	100KΩ	½	B64104	BTS-100K	Horiz. Phase Det. Diode Load
R83	100KΩ	½	B64104	BTS-100K	Horiz. Phase Det. Diode Load
R84	4.7Meg	½	B64475	BTS-4.7Meg	Horiz. Phase Det. Diode Load
R85	27KΩ	½	B84273	BTS-27K	Horiz. Phase Det. Diode Load
R86	470KΩ 20%	½	B85474	BTS-470K	Horiz. AFC Filter
R87	1200Ω	½	B84122	BTS-1200	Horiz. MV Cathode - See Note 8
R88	4700Ω	½	B84473	BTS-4700	Horiz. MV Plate
R89	100KΩ	½	B84104	BTS-100K	Horiz. MV Grid
R90	270KΩ	1	C84274	BTA-270K	Horiz. MV Plate
R91	100Ω 20%	1	C85101		Parasitic Suppressor - See Note 9
R92	1Meg	½	B84105	BTS-1Meg	Horiz. Output Grid
R93	150Ω	2	D84151	BW-2-150	Horiz. Output Cathode
R94	10KΩ	5	43X247	1 3/4A-10K	Horiz. Output Screen - Wire Wound
R95	4300Ω 20%	½			Horiz. Linearity Coil Shunt - See Note 10
R96	22KΩ 5%	2	D83223	BTB-22K-5%	Horiz. Feedback
R97	3.3Ω	½		BW-½-3.3	HV Rectifier Filament - Wire Wound - See Note 11
R98	1Meg 20%	1	C85105		HV Filter
R99	6800Ω	2	D85682	BTB-6800	Decoupling
R100	10KΩ	5	43X247	1 3/4A-10K	Voltage Divider - Wire Wound
R101	1500Ω	10	43X246	1 3/4A-1500	Fliter - Wire Wound
R102	500Ω	10	43X245	1 3/4A-500	Fliter - Wire Wound
R103	1000Ω	2	D84102	BTB-1000	Focus Coil Shunt - See Note 1
R104	500Ω	5	43X257	1 3/4A-500	Focus Coil Shunt - Wire Wound - See Note 12

* Items R58A, R58B, C61A, C61B, and C61C are combined into one unit.
† Items R73A, R73B, R73C, C66A, C66B, and C66C are combined into one unit.

Note 1 Not used in all models.
Note 2 Some models use 1000Ω Resistor in this application.
Note 3 Some models use 22KΩ Resistor in this application.
Note 4 Some models use 5600Ω Resistor in this application.
Note 5 Some models use 82Ω Resistor in this application.
Note 6 Some models use 5.1Ω Resistor in this application.
Note 7 Some models use 470KΩ Resistor in this application.
Note 8 Some models use 1500Ω Resistor in this application.
Note 9 Some models use 150Ω Resistor in this application.
Note 10 Some models use 4700Ω Resistor in this application.
Note 11 Some models use 1Ω Resistor in this application.
Note 12 Some models use 1000Ω 2 watt Resistor in this application.
Note 13 Some models use Series Resistors in this application to obtain desired value.
Note 14 Some models use Parallel Resistors in this application to obtain desired value.

SPEAKER

ITEM No.	RATINGS: FIELD. RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: TRUETONE PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	PM	3.2Ω	12A490	12J12	12A4A	
	CONE DIA.	V. C. DIA.				
SP2	11 7/8"	1"				

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ② 1.9A	760VCT .240ADC	5VAC ② 3A ·	⑥ 6.3VAC ② 1.2A SEC. 4 6.3VAC ② 7.8A	53X313 53X308 ①	P8159 ②		TP-392

① Used in some models.
② Redrill mounting holes.

TRUETONE MODEL 2D1089B

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	DC RESISTANCE		TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.					
T2	170Ω	900Ω	54X5	A-8122 ③	A-3000		Vert. Block Osc. Trans.
T3	485Ω Tap 61Ω	4.5Ω SEC. 2 9Ω Taps .4Ω and 6.5Ω SEC. 3 0Ω	53X315		HV0-6 ④		Horizontal Output Trans.
T4	1060Ω Tap 12.5Ω		51X149	A-8123 ③	A-3036 ③	TS0-1 ③	Vert. Output Trans.
T5A	13Ω		9A2149	DY-7	MDF-70		Horizontal Deflection Coil
B	48Ω						Vertical Deflection Coil
T6	650Ω		9A2147		MF-2		Focus Coil

③ Drill one new mounting hole.
④ Use MWC-1 For AGC Winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T7	5.5KΩ	3.2Ω	490Ω	.9Ω	51X150	A-3877	A-3019 ③	R0-9 ③	③ Drill one new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.240A	52Ω	2 Henries	52X88	C-2326	C-2974 ③	TR-3300 ③	③ Drill one new mounting hole.

COILS (RF-IF)

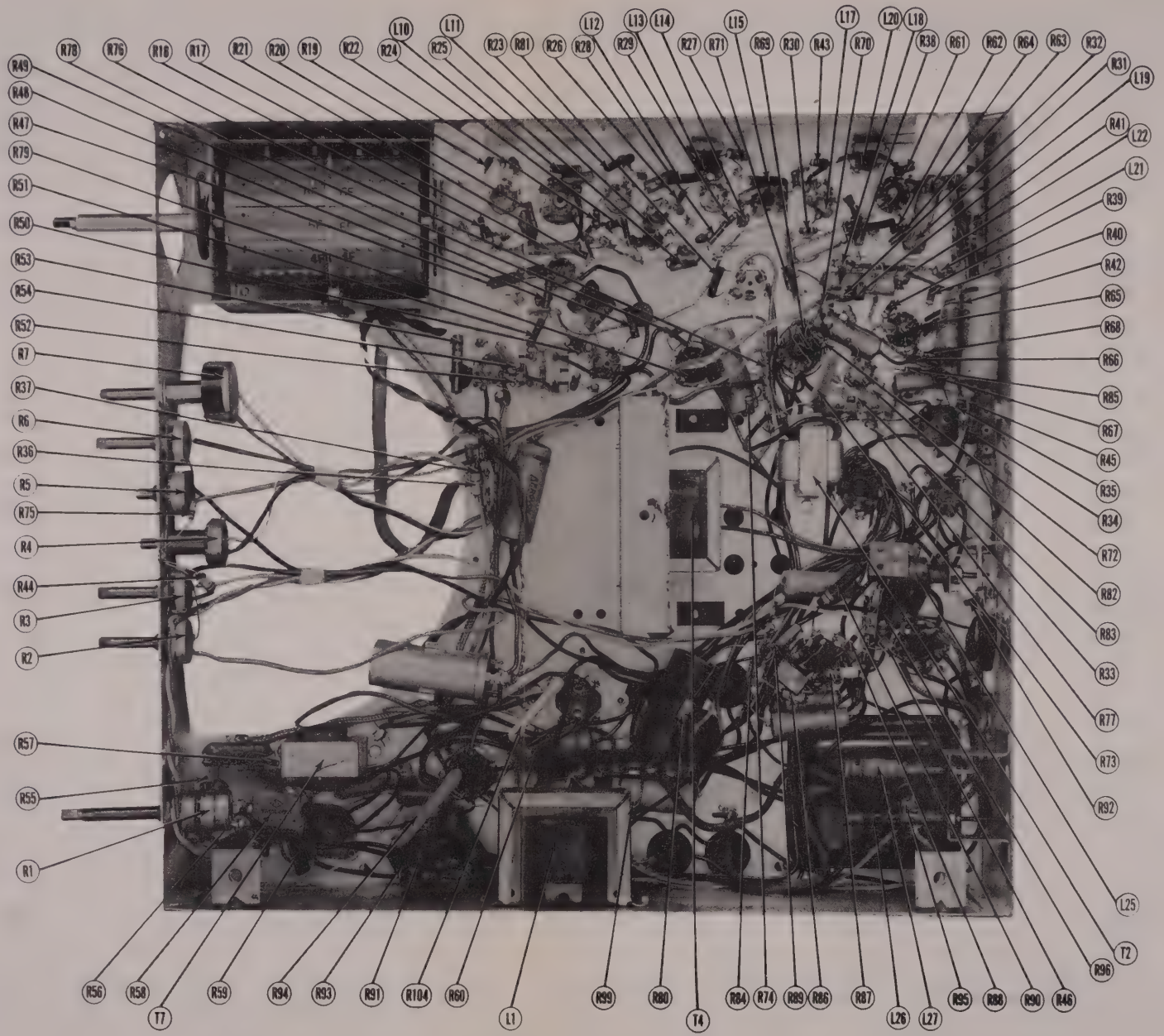
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	TRUETONE PART No.	MEISSNER PART No.	
L2	Ant. Coils	0Ω	0Ω			
L3	Fil. Choke					
L4	RF, Mixer Grid, Osc. Coils	0Ω				
L5	Fil. Choke	0Ω				
L6	1st Video IF					
L7	RF Choke					
L8	IF Coupling Choke	1Ω	1Ω			
L9	2nd Video IF	.2Ω	0Ω	9A2076		
L10	Fil. Choke	0Ω		9A2033		
L11	3rd Video IF	.2Ω	0Ω	9A2055		
L12	Fil. Choke	0Ω		9A2033		
L13	Adj. Video Trap	.2Ω	.1Ω	9A2073		
L14	RF Choke	3Ω		9A1979		
L15	Fil. Choke	0Ω		9A2033		
L16	4th Video IF	.2Ω	.2Ω	9A2071		
L17	Peaking	1.2Meg		9A2090		390 Microhenries (Green Dot)
L18	Peaking	5Ω		9A2086		95 Microhenries (Wound on 4.7Ω resistor - yellow dot)
L19	Peaking	8Ω		9A2088		196 Microhenries (Blue Dot)
L20	4.5MC Trap	.4Ω		9A2074		
L21	Peaking	10Ω		9A2089		183 Microhenries (Wound on 2.2KΩ resistor - Red Dot)
L22	Peaking	6Ω		9A2087		125 Microhenries (White Dot)
L23	1st Sound IF	.2Ω	.2Ω	9A1986		
L24	Discr. Trans.	.1Ω	.1Ω	9A2049		
L25	Horiz. Osc.	53Ω		9A2096		
L26	Horiz. Lin.	25Ω		9A2111		
L27	Horiz. Size	.3Ω		9A1976		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			TRUETONE PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	4AG	.250A Slo-Blo	16X147		313.250	357001	

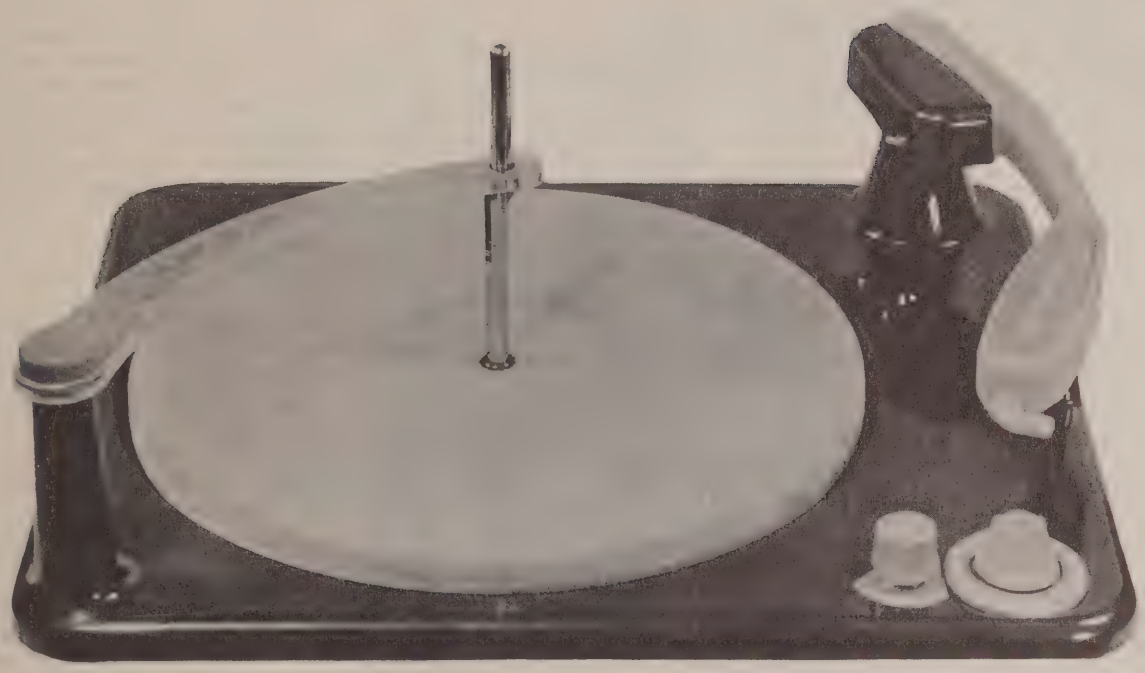
MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M2	RF Tuner	25A1071	
M3	Ion Trap	2A401	
B2	Trimmer	17A261	40-370MMF (Horizontal Drive)
	Escutcheon	4X1029	Off-Volume, Contrast
	Escutcheon	4X1065	Channel Selector
	Escutcheon	4X1102	Control
	Knob	10A741	Channel Selector
	Knob	10A742	Fine Tuning
	Knob	10A752	On / Off Volume
	Knob	10A753	Contrast
	Glass	17X126	Picture



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

WESTINGHOUSE
MODEL V6676



WESTINGHOUSE
MODEL V6676

GENERAL INFORMATION

The Westinghouse Model V6676 is designed to play, automatically, up to ten 12-inch, twelve 10-inch, or ten records intermixed (78RPM or 33-1/3 RPM). The changer will also play as many as twelve 7-inch 33-1/3 RPM records in one loading.

Power Supply is 110-120 volts, 60 cycles, unless otherwise specified.

Manufactured By:

Westinghouse Electric Corporation
Home Radio Division
Sunbury, Pennsylvania

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OPERATING

Loading:

Pull the record support knob (1A) straight up until the record support arm (1) clears the spindle. Swing the record support in either direction until the pin in the shaft drops into the locating groove. Place as many as ten 12-inch, twelve 10-inch, or ten records intermixed (78 RPM or 33-1/3 RPM), or twelve 7-inch 33-1/3 RPM records on the offset shoulder on the spindle. Do not intermix 78 RPM and 33-1/3 RPM records when loading the changer. Gently press down on the record support knob until records are held parallel with the turntable.

To Play Standard Recordings:

1 - Motor speed control knob (38) must be in the "Std." position.

2 - The cartridge control knob (15) should be in the "Std." position..."Std." facing upward.

3 - To start, turn the changer control knob (42) to "Rej." and release. Changer will operate, automatically, until the last record has been played. Pickup arm returns to rest and the control knob to "Off" position. Changer automatically stops.

To Play 33-1/3 Records:

1 - Speed control knob (38) must be in the "Slow" 10-12 position for 10-inch or 12-inch long-play 33-1/3 RPM records, or in the "Slow" 7-position for 7-inch long-play 33-1/3 RPM records.

2 - The cartridge control knob (15) should be rotated to "Slow" position.

Rejecting:

To reject a record at any time while it is playing, turn the control knob to "Rej." and release.

Unloading:

To remove records from the turntable, lift up on the record support knob and swing the record support in either direction until the pin in the shaft drops in the locating groove. Carefully lift the entire stack of records straight up.

CAUTION: When loading or unloading the changer, use care to prevent bending the spindle. Records should never be left on the offset portion of the spindle as they may warp.

Stopping:

To turn off the changer before the last record has been played, turn the control knob to "Off," lift the pickup arm from the record and replace on rest.

Manual Operation:

Off-size, warped records, and home recordings should be played manually. Raise the record support clear of the spindle and swing the record support in either direction until the pin in the support shaft drops into the locating groove. Carefully place a record on the turntable. For a record to pass the step on the spindle, tilt the record toward the back of the pickup arm and work the record carefully over the step. Place the record support (1) over the spindle, permitting it to rest on the step of the spindle. Set the motor control knob (38) and crystal (14) to their relative position, depending on what type of record - 78 or 33-1/3 RPM - is to be played. Turn the control knob (42) to the "On" position; press down on the index lever (19), which is located near the back of the pickup arm (2). Place the pickup arm on the edge of the record. Upon completion of the record, the pickup arm will return to a rest position on the rest post; that is, if the record has an eccentric cutoff groove. If the record does not have an eccentric groove, turn the control knob (42) to "Rej." and release. The arm will then return to the pickup arm rest and shut off automatically. When playing "inside-out" records, press down on the index lever (19) and move the pickup arm all the way in to the spindle before setting it down on the first playing groove of the record.

Repeating a Single Record:

Pull the record support knob (1A) straight up until the record support arm (1) clears the spindle; then swing the record support arm in either direction until the pin in the shaft drops into the locating groove. Remove any records remaining above the offset shoulder of the spindle. The changer will now repeat the top record on the turntable until the control knob is turned to the "Off" position.

CHANGE CYCLE

At the end of the record, the oscillating action of the pickup arm in the eccentric groove causes the pawl (78A), which has been sliding along the serrated portion of the ratchet (93), to straighten, pushing against the ratchet. This pivots the ratchet and trip rod (92) away from the cam clutch pawl (88), allowing the pawl to engage with the teeth of the turntable hub, thus putting the cam in rotation, starting the change cycle.

As the main cam turns, the lift arm (96) is actuated by the lift arm roller (104) riding in the heart-shaped groove on the bottom of the cam gear (83). One end of the lift arm controls the movement of the pickup arm, while the other end actuates the spindle assembly (27).

(Refer to the exploded view for the following reference numbers.) As the lift arm (96) moves, the lift rod (81) rides up cam surface (96A) of the lift arm (96), raising the pickup arm off the record. As soon as the pickup arm is fully raised, cam face (96B) contacts the boss extending down from the ratchet arm (78), swinging the pickup arm out to clear the records. As the pickup arm is swinging out, a projection on the set-down locator (72) snaps into a mating indentation in the ratchet arm (78), caused by the pressure of the lift arm spring (80) against the ratchet arm. When this occurs, the set-down locator turns with the ratchet. Inside the ratchet arm, the safety spring (77) holds a casting on the bottom of the pickup arm locator assembly (72), against a stop surface inside the ratchet arm, so that the two assemblies move together unless the pickup arm is held during the change cycle. In this case, the safety spring allows the ratchet arm to move even though the pickup arm is held, thus preventing injury to the mechanism.

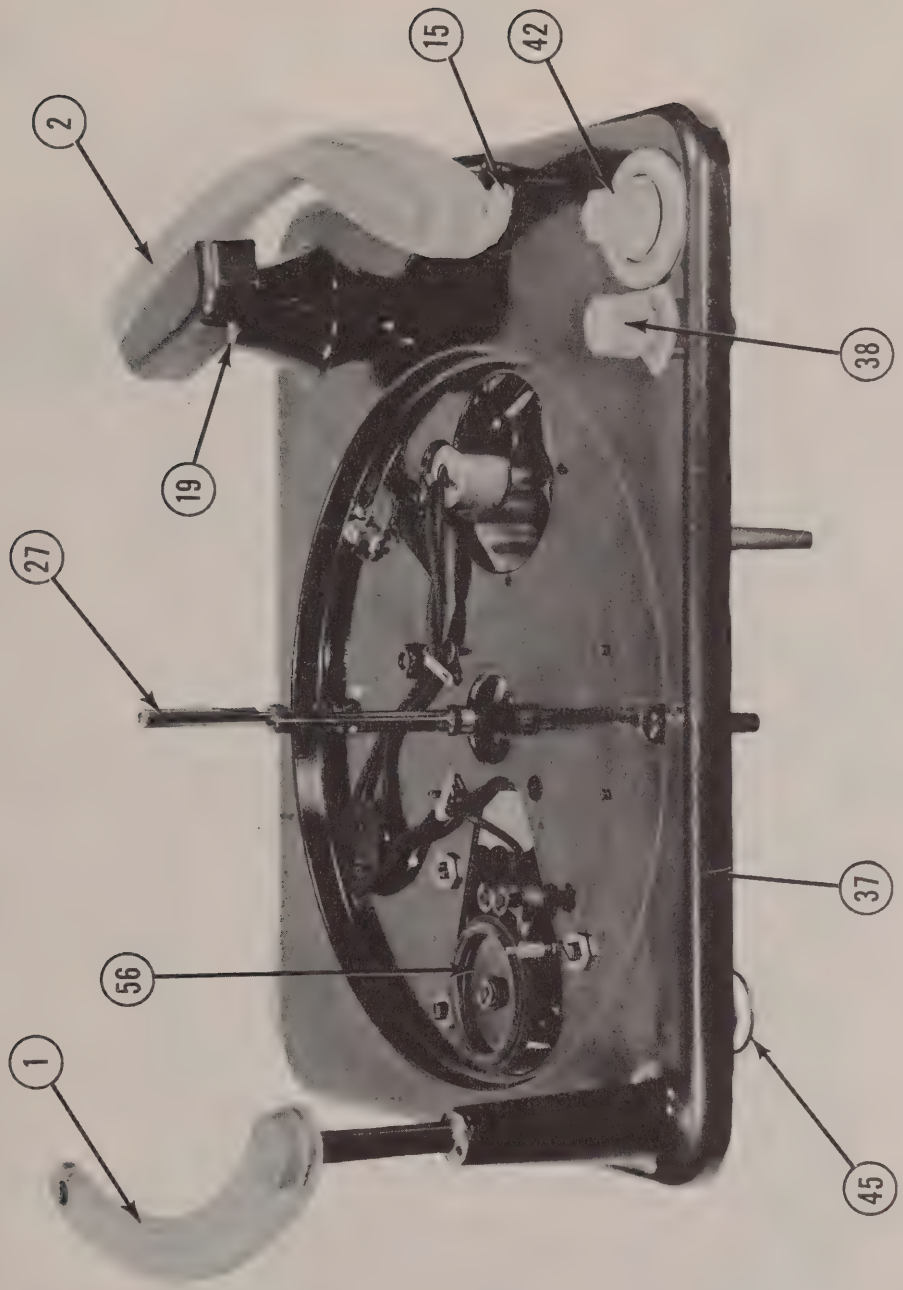


Figure 2

The pickup arm is moved out until a stop extending down from the hinge body (16) strikes a stop in the baseplate. The pickup arm is now clear of the records so that they are free to drop to the turntable. After the hinge body strikes the stop, preventing the pickup arm and hinge body from moving farther, the lift arm boss (96C) contacts the arm (72A) of the set-down locator plate (72), turning the ratchet arm (78) a little farther around. By this movement, the following parts are also turned. The pickup arm locator plate (72), pickup arm locator (74), hinge bearing (22), and the adjusting ring (10). This causes a gap between the end of one leg of the catch (17) and the catch surface extending from the adjusting ring (10). This allows the catch spring (20) to pull the leg on the catch (17) around until it hits the stop extending out at right angles to the outer step in the leg on the adjusting ring (10). In this position, the pickup arm will set down for a 10-inch record. When a 12-inch record is dropped, the record hits the index lever (19), which, in turn, pivots the hinge cam (18) against the catch (17) moving it away from the

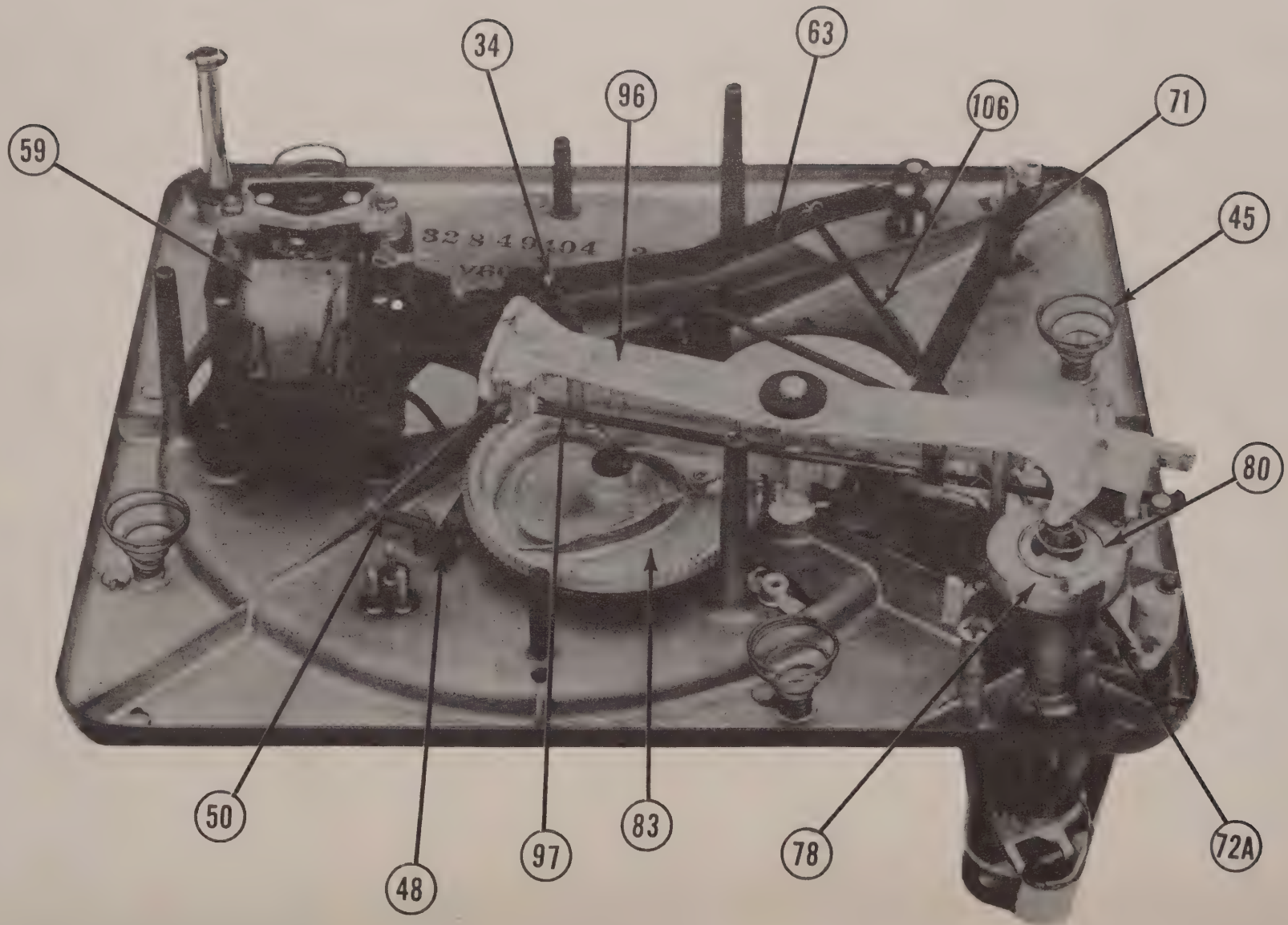


Figure 3

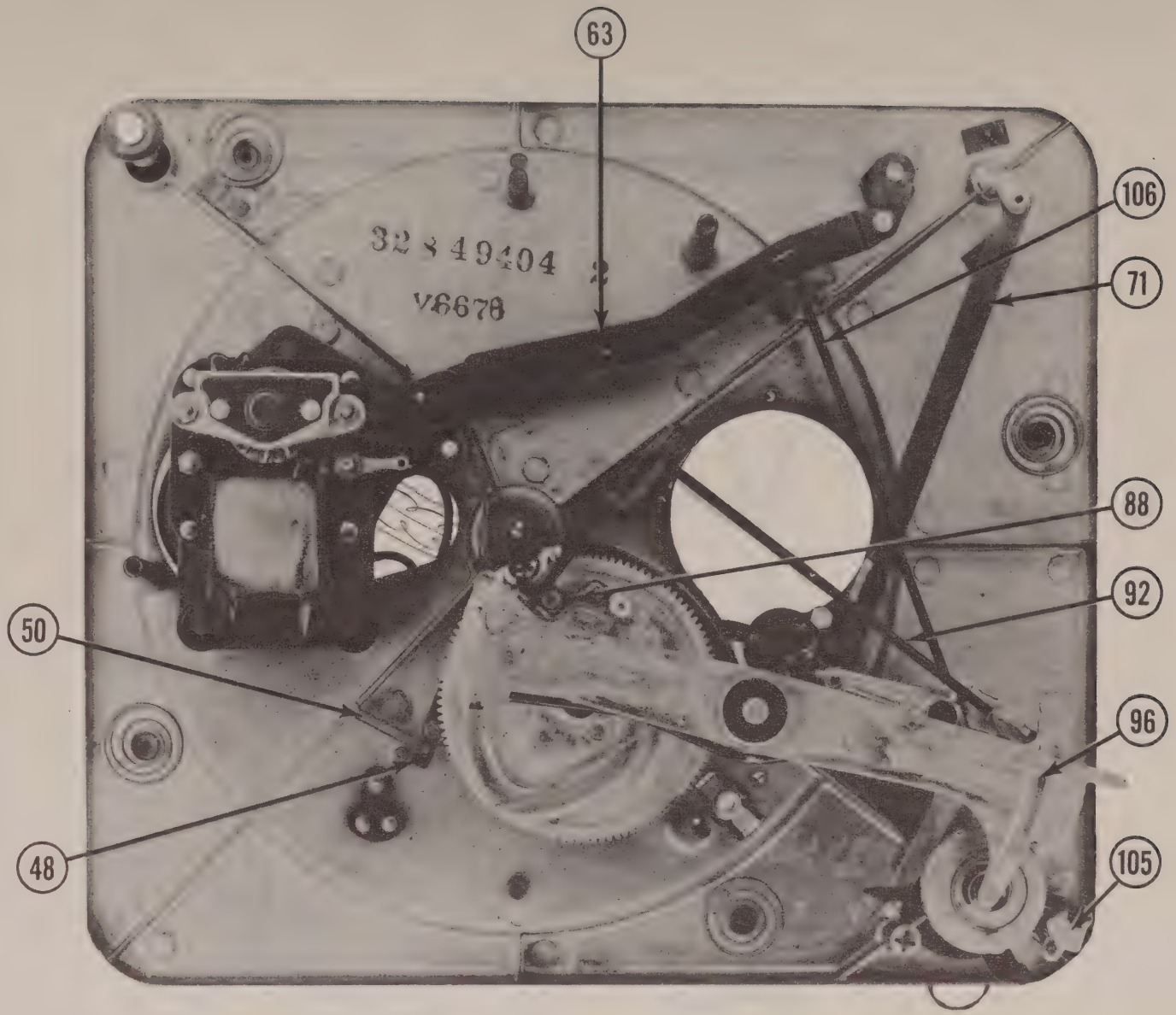
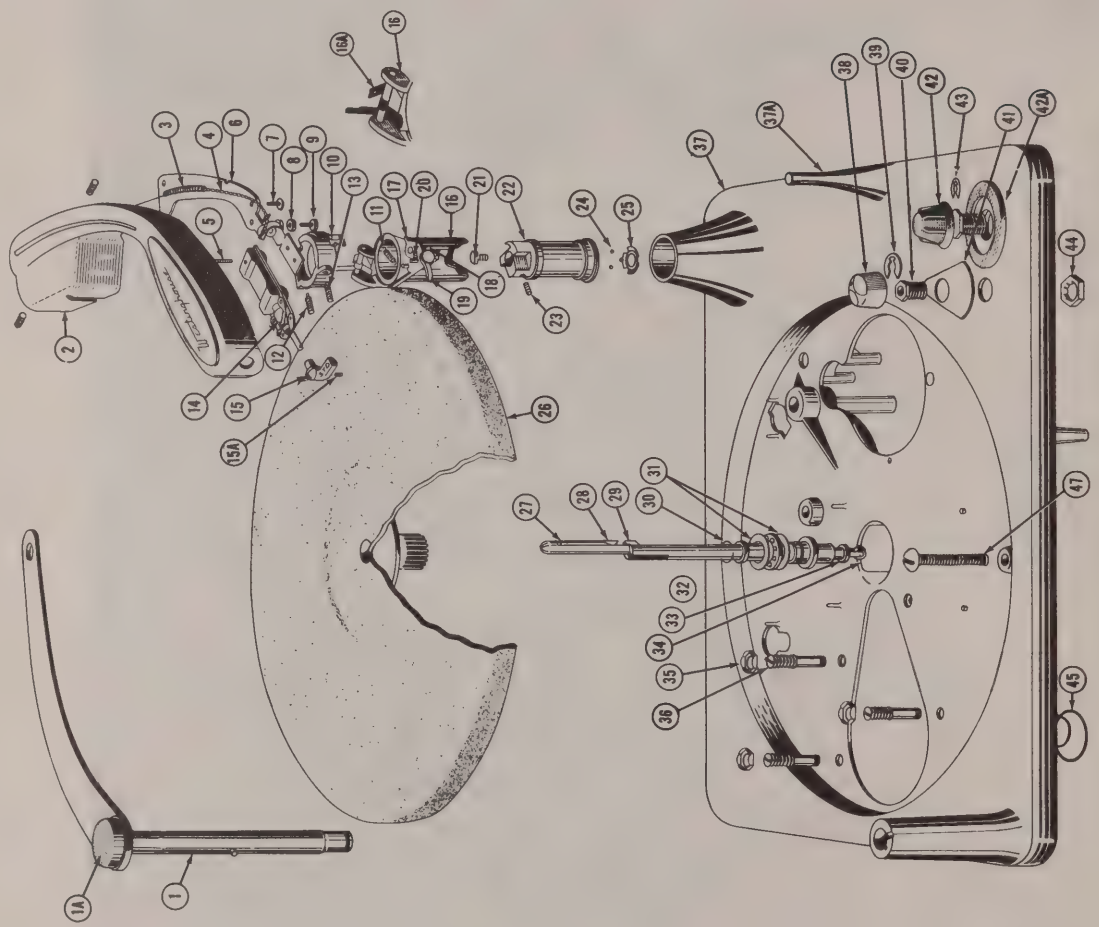


Figure 4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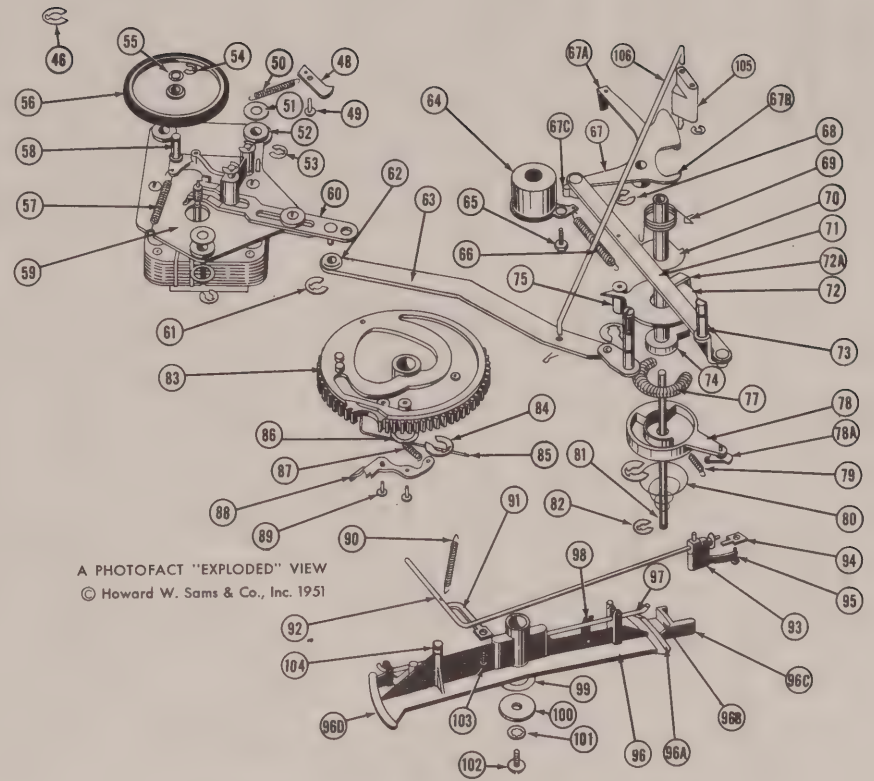
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A PHOTOFACT "EXPLODED" VIEW
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outer step of the adjusting ring. The catch is held in this position by the step in the hinge cam, which rests on the surface of the catch, to prevent the catch from returning to its original position. The pickup arm is now set for 12-inch set down by the tension of the ring spring (11), which pulls against the hinge body (16).

At approximately the same time the cam face (96B) contacts the boss of the ratchet arm, cam surface (96D) contacts the spindle roller (34). The roller now rides up the cam, actuating the spindle assembly (27), thus dropping a record to the turntable.

The heart-shaped groove in the bottom of the cam now reverses the movement of the lift arm (96), returning the spindle assembly to its original position and swinging the pickup arm in, positioning it for set down and lowering it to the record.

The 10-inch, 12-inch, and 7-inch set down point is determined by the engagement of the ratchet arm finger (72A) and the index cam (105). For 10-inch and 12-inch setdown, the index cam (105) is in an outward position. For 7-inch setdown, the index cam (105) is pivoted inward, thus allowing the pickup arm to swing further inward.

When the lift rod (81) is completely lowered, the tension of the rod spring (80) against the ratchet arm (78) is released. The ratchet arm will now drop down forming a gap between the indentation in the ratchet arm (78) and the projection on the locator (72). This allows the pickup arm to have free movement on the record.

The cam clutch pawl (88) of the main cam (83) now moves against the end of the trip rod (92), holding the pawl from engaging the teeth of the turntable hub. The open section of the main cam is held, in respect to the turntable hub, by the engagement of the cam locator (48) with the two studs on the top side of the main cam, thus completing the change cycle.

After the last record has been played, the record support (1), which is flush with the offset shoulder on the spindle (27), engages the pusher (29) and keeps it from completing its full travel. This prevents the spindle pusher housing (33) from completely retracting as the roller (34) rides up the lift arm cam surface (96D). When the roller reaches the top of the cam surface, the cutoff rod (97) engages the shoulder of the spindle pusher housing (33). This causes the cutoff rod (97) to rotate 90°. As the lift arm (96) reverses its motion, the opposite end of the cutoff rod engages the control lever (67) pivoting the finger (67A) of the lever in the path of the set-down locator plate finger (72). This prevents the pickup arm from moving in over the record; further rotation of the lift arm (96) causes the control lever to actuate the switch (64) and control knob (42) to the off position. This completes the shutoff cycle of operation.

LUBRICATION

Additional lubrication should not be required for the life of the changer, but in cases of unusual use or high-operating temperature, the changer should be lubricated as follows (refer to the exploded view):

Apply Lubriplate to:

1 - Hinge bearing (22).

2 - Ratchet arm (78) and set-down locator plate (72).

3 - Cam faces on lift arm (96), lift arm bearing, and lift arm cut-off rod bearings.

4 - Between lever spring (98) and cut-off rod (97).

5 - Heart-shaped cam track on cam (83) and cam bearing.

6 - Spindle between roller plunger (34) and roller spring housing (33), and between the roller spring housing and the spindle body.

7 - Turntable ball bearing.

8 - Frictional surfaces of lever (60).

Apply A Small Quantity of Light Oil to:

1 - Pickup arm locator assembly bearing (74) and ball bearing in pickup arm post.

2 - Ratchet pawl (78A) bearing.

3 - Trip rod (92) bearings.

4 - Control lever bearing (67).

5 - Turntable and spindle bearing.

ADJUSTMENTS

Pickup Arm Setdown (Refer to the exploded view):

The set-down position of the needle is adjusted by means of the two adjusting screws (12 and 13). If the needle is setting down too far out on the record, loosen the back screw (12) about 1/4 turn and tighten the front screw (13) to lock the adjustment in place. If the needle is setting down too far in on the record, loosen the front screw and tighten the back screw.

Pickup Arm Height (Refer to the exploded view):

The pickup arm height is adjusted by the screw (21) located on top of the pickup arm lift rod (81). Turn the screw out, or in, until the underneath side of the pickup arm clears the rest by 1/8 to 3/16 .

Pickup Arm Weight (Refer to the exploded view):

With the cartridge control lever (15) in the slow position, the needle pressure should be between 6 and 10 grams. If the pressure is in excess of 10 grams, bend the drilled end of the hinge bracket (16A) away from the hinge bearing assembly (16). If the pressure is less than 6 grams, the needle may not track in the record grooves. To correct this condition, bend the drilled end (16A) of the hinge bracket forward in the direction of the hinge bearing assembly.

There is no adjustment for "Std." play pressure inasmuch as the pickup arm is designed to give this needle pressure.

SERVICE INFORMATION

Control Knob Cannot Be Turned To "On" Position:

Machine shut off during cycle:

Turn the turntable clockwise, by hand, until the control knob is free.

Turntable Does Not Revolve When Control Knob Is Turned to "On" Position:

1 - Machine stalled in cycle:

Turn the turntable clockwise, by hand, until it starts rotating under its own power.

2 - No current at motor:

(a) Check to determine if current is reaching AC leads of changer.

(b) Check the switch to determine if it is closing.

(c) Check wiring and soldered terminals in the changer.

3 - Motor defective.

Remove turntable to allow motor to operate without load. If current is reaching motor and pulley does not rotate, the motor is defective. Repair or replace.

4 - Motor idler wheel not engaging turntable rim. If motor pulley is turning but turntable is not:

(a) Check motor idler assembly to determine if it is free to contact the motor pulley and the turntable.

(b) Wipe off the inside rim on the turntable to remove flock, or if oily, clean with the turntable rim and rubber tire of the idler wheel (56) with carbon tetrachloride.

(c) Spring (57) loose; not holding idler wheel in contact with motor shaft.

Changer Does Not Cycle When The Control Knob Is Turned To The "Rej." Position:

1 - Manual reject not actuating the trip. Turn the control knob to the "Rej." position, hold, and see if the leg (67B) on the control lever (67) is contacting the stud on the ratchet (93) and turning the trip rod (92) sufficiently to allow the trip rod to disengage the clutch pawl (88).

2 - Trip not actuating clutch:

When the trip rod (92) is turned, and the clutch pawl (88) does not move forward, engaging the teeth of the turntable, check for a loose pawl spring (87) or binding between the clutch pawl and the cam. If binding occurs, clean out foreign matter and check for freedom, but do not oil.

Record Does Not Drop When Changer Cycles:

1 - Spindle pusher shaft broken.

If the pusher shaft (inside the spindle) is broken, the roller assembly (34) will drop out of the spindle. Loosen the set screws in the spindle housing of the base plate and remove the spindle assembly (27). Replace with a new spindle unit.

2 - Pusher in spindle not moving far enough forward to eject a record. The pusher (29) should move up inside the spindle body, then move forward until it has reached a point flush with, or a maximum of, .010 beyond the spindle body. To assure that the pusher is all the way forward, the spindle roller (34) should be raised high enough by the lift arm (96) at the top of the cam face to slightly compress the roller spring inside the pusher housing (33). See "Turntable Stalls During Cycle"). If the roller spring is compressed and the pusher (29) does not move far enough forward to eject a record, the spindle should be replaced. If a record is not pushed completely off the ledge, it may hang up on the spindle momentarily, then drop on the pickup arm when it moves in over the turntable.

3 - Lift Arm Screw Loose:

Check screw (102) to determine if it is turned all the way in.

4 - Pusher Raises Outside Spindle Body:

When the changer cycles, the pusher (29) should first raise up inside the spindle body, then move forward inside the center hole in the record. If the pusher raises outside the spindle body, it will raise the record instead of pushing it off the spindle ledge. Remove the spindle and replace with a complete new spindle assembly.

5 - Lift Arm Roller Broken Off:

If the lift arm roller (104) is broken off, the lift arm (96) will not turn when the cam revolves.

Two Records Drop At Once:

1 - Hole in Record Too Large:

Check the diameter of the hole in the record. An oversize hole will cause two records to drop at once.

2 - Spindle Slide Not Fully Down:

If the spindle slide (28) is not all the way down, more than one record may be dropped at a time:

(a) Check the slide to be sure it is free and does not bind at any point. Clean out foreign matter or straighten if necessary.

(b) When records are placed on the spindle, be sure the slide is all the way down. The slide will normally raise slightly as a record is being dropped, but it should return to place immediately.

3 - Record support binding on spindle or bent out of square with the shaft.

The record support must be able to slide freely, by gravity, down the spindle. If the support does not follow the records down as they are being ejected, two or more records may be ejected at once. If binding occurs:

(a) Check the spindle to determine if it is

straight. Bend carefully with the fingers, if necessary.

(b) Straighten the record support (1) if it is not square with the record support shaft.

(c) If the hole in the record support is not centered over the spindle after checking (a) and (b), bend the support shaft post on the baseplate until the hole in the record support is centered over the spindle.

(d) When the pin in the record support shaft has just entered the slot in the record support shaft post on the baseplate, the play in the record support, as it is swung from one side to the other, should be equal on both sides of the spindle. To correct bent condition, hold the support shaft and carefully force the record support into the proper position. If the support is loose on the shaft, remove the knob and restake with hammer and punch.

4 - Record Pusher Defective:

The record pusher (29) may be deformed, etc. This may cause two records to drop at once. Replace with new spindle assembly or pusher (29).

Record Hits Pickup Arm:

1 - Pusher in spindle not moving far enough forward to eject record. (See "Record Does Not Drop When Changer Cycles" - 2)

2 - Lift Arm Screw Loose:

Tighten lift arm screw (102).

3 - Pusher Extending Beyond Outside Diameter of Spindle:

Cycle changer, by hand, until roller assembly (34) is at the top of its travel. Using a new record as a gauge, pass it over spindle to see if it binds at any point. File off high points on pusher (29) with a fine file until record will pass freely over spindle.

4 - Pickup Arm Not Adjusted Properly:

The adjustment procedure for the needle set-down point is given under "Adjustments." If the hinge bearing (22) has been removed, or the hinge bearing setscrew (23) has been loosened, the relationship between the hinge bearing and the pickup arm locator assembly (74) must be reset. The procedure is as follows: Loosen the setscrew (23) sufficiently to allow the hinge bearing to slide on the pickup arm locator assembly shaft. The setscrew may be adjusted with an Allen wrench through the hole in the adjusting ring (10) located between the two adjusting screws (12 and 13). Place a 1/32 shim between the set-down locator (72) and the ratchet arm (78). Turn the control knob to the "Off" position. Raise the pickup arm and rotate the hinge assembly counterclockwise as far as it will go. In this position the arm extending from the set-down locator should be engaged by the turned-down leg on the control lever (67). Take up all the play between the parts by pressing up on the bottom of the ratchet arm and down on the top of the hinge bearing. Tighten the hinge body setscrew (23) and remove the shim.

Needle Does Not Set Down On 10" Record in Proper Position:

1 - Pickup arm not adjusted properly. (See "Record Hits Pickup Arm" - 4)

2 - Hinge catch (17) does not return to 10" record position when changer cycles:

(a) Stop the machine in mid-cycle when the lift arm (96) has moved as far out as it will go and is about to move back to its starting position. Lift the pickup arm and see if there is a gap of at least 1/64" between the end of the leg on the catch (17) and the outside step on the adjusting ring (10). The catch should be free to allow it to be pulled forward against the stop at the end of the leg on the adjusting ring. If there is not enough gap, check the setting of the hinge body and the pickup arm locator. (See "Record Hits Pickup Arm" - 4). If the setting is incorrect, the cam face on the lift arm (96), which contacts the round stud on the bottom of the ratchet arm (78), may be bent. The ratchet arm should be forced around far enough to bring the pickup arm out until the stop on the bottom of the hinge casting meets the stop in the baseplate; then, to assure that the pickup arm is out as far as it will go, the lift arm should move the ratchet arm a few degrees farther around, which will slightly compress the safety spring (77) and hold the pickup arm out firmly against the stop.

(b) Lubricate the hinge bearing with lubriplate. Do not use heavy grease. If the bearing between the hinge bearing and hinge body binds, the safety spring will compress instead of bringing the hinge body around firmly against the stop.

3 – Binding between safety spring and ratchet arm:

(a) If the safety spring (77) binds against the ratchet arm and does not hold the casting on the bottom of the pickup arm locator assembly (74) against the stop inside the ratchet arm, irregular needle set down will result. Disassemble the pickup arm locator assembly (74) by removing the lift arm (96), loosening the hinge bearing setscrew (23), and pulling the ratchet arm and pickup arm locator assemblies down from the bottom of the changer. Hold the pickup arm locator shaft in one hand, turn the ratchet arm assembly to slightly compress the safety spring, release, and see if the safety spring returns the pickup locator casting firmly against the stop surface in the ratchet arm assembly. If binding occurs, remove the safety spring to see if the pickup arm locator casting turns freely in the ratchet arm casting. Remove burrs or sharp edge on end of safety spring, stretch safety spring a little to increase tension, and replace.

(b) Check to see if the locator plate (72) is meshing with the ratchet arm (78) when the lift rod (81) is positioned at the be-

ginning of the sloping cam surface (96A) of the lift arm (96) in the final stage of the cycle.

To test the meshing of the locator plate and the ratchet arm, swing the tone arm half way in toward the spindle. If the locator plate and the ratchet arm disengage when in the above position, it is necessary to reset the clearance between the locator plate and the ratchet arm. Also, it may be necessary to file off any burrs which may be present on the mating surfaces of the locator plate and the ratchet arm.

4 - Hinge Catch Does Not Disengage from the Hinge Cam:

When the index lever (19) has been depressed, it is held in the position until the catch (17) is disengaged. (See "Needle Does Not Set Down on 12" Record in Proper Position" - 6). When the cycle is completed, if the catch does not disengage from the hinge cam (18):

(a) Check to determine if the leg on the catch (17) is sliding down the incline on the leg of the adjusting ring (10). (See "Needle Does Not Set Down On 12" Record In Proper Position" - 6).

(b) The catch (17) and the hinge cam (18) are not disengaging when the catch leg is resting on the inside step on the adjusting ring. If this occurs, file the edge of the catch which contacts the hinge cam until the two parts have a clearance between them of about 1/64" when the leg on the catch is on the inside step on the adjusting ring.

Needle Does Not Set Down On 12" Record In Proper Position:

1 - Diameter of 12" record undersize:

The set-down position of the needle for 12" records is determined by the edge of the record striking the index lever (19). If a 12" record has a diameter of less than the standard size of 11-7/8", plus or minus 1/32", it may fail to depress the trip lever far enough.

2 - Enlarged center hole in record:

An enlarged center hole might fail to set the index lever because it could produce the same effect as a small record.

3 - Pickup arm not adjusted properly. (See "Record Hits Pickup Arm" - 4).

4 - Binding between safety spring and ratchet arm. (See "Needle Does Not Set Down on 10 Record in Proper Position" - 3).

5 - Index lever does not cock when 12" record drops:

Allow a 12 record to drop to the turntable and stop the changer just after it falls, before the pickup arm has a chance to move in over the record. The index lever (19) should be forced down until the step on the hinge cam (18) passes the edge of the catch (17), preventing the hinge cam and the index lever from returning to their original position. If the index lever does not stay down in a depressed position:

(a) Check the catch (17) to see if it is free to move forward and engage the hinge cam.

(b) If the stop on the hinge body (16) is defective, it might allow the pickup arm to move too far out, thus moving the index lever away from the spindle. This would produce the same effect as an undersize record.

6 - Hinge catch does not go inside step on adjusting ring when index lever is depressed:

When the index lever (19) is tripped by a falling 12" record, the leg on the catch (17) should be moved out over the incline between the inside and outside steps on the adjusting ring leg and held in that position by the shoulder on the hinge cam (18) until the pickup arm starts to move in over the record. When this occurs, the leg on the catch should contact the incline and be moved out as it slides down the incline until the catch is disengaged and the index lever can snap back up to a horizontal position. If the leg on the catch is not moved out far enough to enable it to slide down the incline, file about 1/64" chamfer on the edge of the catch leg which contacts the incline.

Check for binding between hinge body (16) and hinge bearing (22). Burrs on the bearing surfaces, or lack of lubrication, may prevent the hinge bearing from turning freely.

Needle Does Not Set Down On 7" Record In Proper Position (Refer to "Needle Does Not Set Down On 10" Record In Proper Position"):

1 - The Index Lever (106) loose on the index cam)105) or the speed control link (63), thereby not pivoting the index cam inwardly, which positions the pickup arm for set down.

Needle Does Not Track Across Record Properly:

1 - Needle may be clogged by accumulation of lint, dirt, etc.

2 - Ratchet arm does not disengage from the set-down locator when a cycle is completed.

(a) There should be a 1/32" gap between the ratchet arm and the set-down locator when the machine is not in a cycle. If the gap is small enough to allow the parts to touch and bind as the needle moves across the record, the hinge bearing must be reset. (See "Record Hits Pickup Arm" - 4).

3 - Hinge bearing binds.

Place a block under the back end of the pickup arm to prevent the needle from touching the turntable. With sensitive gram scale, check the amount of force required to move the pickup arm across the turntable. The force required should not exceed 2 grams. If the pressure required is excessive:

(a) Check the ratchet arm and set-down locator for binding. (See 2 above)

(b) Check the bearing in the pickup arm post for binding.

The bearing is located below the hinge bearing (22). To inspect it, loosen the setscrew (23) in the hinge bearing. Unsolder the pickup leads and pull them out. Pull up on the hinge and pickup assemblies. Clean foreign matter or corrosion from the bearings; lubricate with light oil. (To reset position, see "Record Hits Pickup Arm" - 4).

4 - Insufficient weight of the pickup arm when in "slow" position:

If the needle does not track across the record when in "Slow" position, after 1, 2, and 3 have been checked, it may be found that the weight of the arm is not great enough to hold the needle in the grooves of the record.

(a) Check the weight of the pickup arm with a gram scale. The weight of the arm should be between 6 and 10 grams.

Changer Trips Before Needle Reaches End Of Record:

1 - Hole in record too large.

If hole in record is too large, the groove may turn eccentric with the spindle and cause premature tripping.

2 - Insufficient tension on trip spring.

The trip spring (90) should have enough tension to pull the trip rod back to a fully engaged position if an eccentric record is being played.

3 - Binding in trip rod bearings.

With the trip released, check the trip rod for play in the bearings. It should be free to turn without binding.

Changer Does Not Cycle When Record Has Been Played:

1 - Binding in trip rod bearings. (See "Changer Trips Before Needle Reaches End of Record" - 3).

2 - No eccentric trip groove on record:

All standard records made today have an eccentric trip groove, but some records made in the past did not have this groove. When records of this type are being played, the control knob must be returned to "Rej." at the end of the record.

3 - Ratchet pawl not engaging the ratchet sector:

The ratchet pawl (78A) must press against the ratchet sector forcing it back when the motion of the pickup arm is reversed. If the pawl does not contact the ratchet sector or slides over it:

(a) Check the pawl (78A) for burrs around the hole.

(b) Be sure the pawl is free to turn on the bearing. If the drive pin is driven down too far, causing binding, the pin may be relieved by tapping up on the shank.

(c) Check the pawl spring (79) for insufficient tension.

(d) Check the point on the pawl. It should be sharp to enable it to dig into the ratchet teeth. Sharpen with stone, if necessary.

4 - Ratchet sector too far away from ratchet pawl.

If the ratchet sector (93) is too far away from the pawl (78A), the eccentric motion required to operate the trip will be excessive. If necessary, bend the trip bracket in slightly to reduce the distance. If the sector is too close to the pawl, excessive trip pressure will result.

5 - Needle jumps out of eccentric groove in record.

(a) Check trip pressure....should not exceed 8 grams. (If the pressure is excessive, see paragraph 4 immediately preceding.)

(b) The record may be defective. The trip groove is often too shallow. Check with a record which is known to be good.

(c) The needle point may be damaged or affected by an excessive accumulation of dust, lint, etc.

(d) There may be binding in the pickup bearing or ratchet arm. (See 2 and 3 "Needle Does Not Track Across Record Properly").

6 - Clutch Pawl Binding on Cam Face:

The clutch pawl (88) must be free to move forward and engage the teeth of the turntable hub when the trip rod releases it. Check for burrs or foreign matter lodged between the pawl and the cam. Do not oil as this might collect dirt and gum up the pawl.

Pickup Arm Strikes Records On Spindle When It Raises Or Pickup Arm Rest When It Moves Out:

Pickup arm height not adjusted properly. (See instructions for adjusting the pickup arm height under "Adjustments").

Turntable Speed Too Slow (Refer to the exploded view):

1 - Binding in turntable bearing.

Check the turntable bearing for freedom. Hold the motor idler wheel (56) out of engagement with the turntable and spin the turntable, by hand, to see if it turns readily and coasts for a long time. If binding occurs, remove turntable, foreign matter, and lubricate with light oil.

2 - Motor pulley too small in diameter. Re-

place the motor pulley with one having a greater diameter.

3 - Line voltage too low. The line voltage should not be less than 100 volts or the turntable may be too slow.

4 - Operating temperature too low. If the machine has been stored in a cold place, or operated in surroundings at a temperature of less than 60°F, the turntable speed may be too slow.

Turntable Speed Too Fast:

Motor pulley too large in diameter. Replace the pulley with one having a smaller diameter, or grind one or two thousandths off the pulley.

Turntable Does Not Rotate At 33-1/3 R.P.M. When In "Slow" Position:

(a) Check the idler wheel bracket (58) to see if it is properly positioned when the control knob is rotated from "Stud." to "Slow" position.

(b) Check idler wheel (56) to see if it is engaging the small diameter of the motor pulley.

Turntable Stalls During Cycle:

1 - Motor idler not engaging turntable. (See "Turntable Does Not Revolve When Control Knob Is Turned To "On" Position - 4).

2 - Turntable bearing tight. (See "Turntable Speed Too Slow" - 1).

3 - Operating temperature too low. (See "Turntable Speed Too Slow" - 4).

4 - Line voltage too low.

The line voltage should not be less than 100 volts.

5 - Binding in drive mechanism.

(a) Remove lift arm (96) and hold idler (56) away from the turntable, or remove idler wheel. Cycle machine, turning turntable slowly by hand. The cam should turn freely for the complete revolution without binding at any point. If binding occurs, check for foreign matter in the gear teeth, a bent cam bearing or bent spindle bushing.

(b) Replace lift arm, loosen spindle screw, and raise spindle high enough to clear the lift arm cam when the machine cycles. Hold the pickup arm lift rod (81) up so the end of the lift rod does not contact the lift arm cam. Cycle the machine by hand. The entire cycle should be free, without binding at any point. If binding occurs, check the lift arm bearing for freedom and the lift arm roller to be sure it is not bent, causing binding in the cam track.

6 - Binding between pickup arm lift rod and lift arm cam face. Cycle machine, stopping it halfway through the cycle just as the lift arm is about to return. Lift pickup arm and raise lift rod (81) by pulling up on the adjusting screw (21) as high as it will go. Feel the lift arm (96) for play. The lift rod may still touch the lift arm cam face, but it should not bind. If binding occurs, the lift arm bearing may be bent or the fiber washer (99) under the lift arm should be removed to lower the lift arm.

7 - Spindle roller spring compressed too far. Cycle the changer and watch the relationship between the bottom of the pusher housing (33) and the roller (34). Just before the top of the lift arm cam raise is reached, the pusher housing should stop its upward motion and the roller should continue up .005" to .047" more, slightly compressing the roller spring. If the spring compresses too much, the changer may stall on the shutoff cycle. Check the lift arm bearing to determine if it is square with the baseplate. It should be 90° to the baseplate within 1/4°. If it is bent, carefully pound into place with a soft mallet. If it is straight and the roller spring is being compressed too much, remove the fiber washer (99) between the lift arm and the steel washer under it.

8 - Motor weak. In case where everything checks all right, but the changer still stalls in cycle, the motor may be weak.

Changer Continues To Cycle:

1 - Trip rod not holding clutch pawl out of engagement with the teeth on the turntable hub. The end of the trip rod (92) should contact the bent-up section of the clutch pawl (88) and push the pawl out of engagement with the teeth on the turntable hub. If the trip rod is not free to meet the clutch pawl, continuous cycling will result:

(a) See if trip spring (90) is in place.

(b) Insufficient tension on the trip spring (90).

(c) Check the trip rod (92) for freedom in its bearings.

2 - Defective clutch pawl (88).

3 - Reject control holding trip open. Check the control knob (42), control link (71), and control lever (67) for binding to determine if the control assembly is holding the trip rod in a disengaged position with the clutch pawl.

Noise During Playing Of Record:

1 - Rumble:

(a) From motor: If a low-pitched rumbling sound comes from the loud speaker while a record is being played, check the motor grommets (52) (exploded view) to be sure the motor is freely suspended on them. The motor lead wires should have slack to allow the motor to float. Motor rumble may also come from an out-of-balance motor rotor. In this case, the motor should be replaced.

(b) From bearings: Defective turntable bearings can cause rumble. Check for foreign matter in the bearing, defective

balls binding between balls, and ball retainer; rough surface on washers. Clean ball bearing, sleeve bearing, and washers; lubricate with lubriplate or light oil.

2 - Defective motor idler wheel:

A rapid thumping sound while the motor is running may indicate a flat spot on the motor idler wheel (56) (exploded view). If this condition does not clear up after ten minutes of run-in time, remove the turntable and check the rubber tire on the idler. If the surface of the rubber tire is not smooth and even, replace the idler.

3 - Defective record:

Worn or defective records cause needle scratch and distortion of the recorded sound. If the record is warped, it may slip on the other records, causing "Wow", a waver in the recorded sound. An enlarged hole in the record can also cause "Wow".

4 - Turntable scrapes:

If a scraping sound occurs as the turntable revolves, check:

(a) Turntable warped, causing outer rim to rise and fall.

(b) Motor idler or mounting plate bent.

(c) Wires beneath turntable rubbing.

5 - Squeaks:

Squeaking sound as changer operates indicates lack of oil. Lubricate points indicated under "Lubrication."

Distortion Of Recorded Sound:

1 - Defective record. (See "Noise During Playing of Record" - 3).

2 - Defective amplifier.

Check phonograph amplifier and speaker.

3 - Bad cartridge.

No Sound During Playing:

1 - Defective cartridge.

2 - Defective wiring.

Check pickup leads for a shorted or open lead.

3 - Defective amplifier.

Excessive Record Wear:

1 - Binding in pickup arm. (See "Needle Does Not Track Across Record Properly" - Nos. 2 and 3).

2 - Excessive weight of the pickup arm when playing the new L.P. 33-1/3 R.P.M. records:

(a) Check the cartridge to see if it is in the "Slow" position.

(b) Check weight of pickup arm, while in "Slow" position, with a gram scale. The weight of the arm should not exceed 10 grams.

Changer Does Not Shut Off After Last Record Has Been Played:

1 - Record support binding on spindle.

The record support (1) must rest on the offset shoulder of the spindle or the changer will not shut off. (See "Two Records Drop At Once" - 3).

2 - Cut-off rod (97) not engaging shoulder on spindle pusher housing (33).

On the shut-off cycle, the end of cut-off rod (97) should contact the shoulder on the bottom of the spindle pusher housing (33) and turn the cut-off rod over 90°. If the end of the cut-off rod passes under the pusher housing as the machine cycles on the shut-off cycle, check:

(a) The record support, to be sure it is resting on the spindle. (See 1, above).

(b) The spindle, to see if it is being held in place by the spindle set screws.

(c) The lift arm screw (102), to be sure it is tight.

(d) The bent-up end of the cut-off rod (97) may be short. Replace, if necessary.

Pickup Arm Does Not Set Down On Rest After Last Record Has Been Played:

Control lever does not engage set-down locator. On the shut-off cycle, the leg of the control lever (67) should catch the set-down locator (72) holding it to prevent the return spring (69) from pulling the pickup arm in. The pickup arm should be held against the stop in the baseplate. In this position, the nest in the pickup arm should be directly above the pickup rest.

Pickup Arm Returns To Rest Instead Of Setting Down On Start Of Record When Control Knob Is Turned To "Reject" Position:

1 - Check to insure the proper amount of tolerance between locator plate (72) and ratchet arm assembly (78). (See "Record Hits Pickup Arm" - 4). Check also to see if the detented portion of the two parts mesh properly during the change cycle and disengage upon completion of the cycle.

2 - Check to be sure that the "adjusting tail" item (72A) on the locator plate (72) has not been damaged. This should engage with the lift arm assembly at point (96C) during the change cycle to cause the ratchet arm assembly item (78) to mesh properly with the set-down locator plate item (72).

Changer Shuts Off Prematurely:

1 - Spindle roller spring compressed too far. (See "Turntable Stalls During Cycle" - 7).

2 - Roller spring in spindle too weak.

When the bottom record of a stack of ten 12" records is being ejected from the spindle ledge, the roller spring (in the housing) should not compress until just before the roller reaches the top of the cam incline on the lift arm. If the roller spring is compressed under the load of a full stack of records, it may cause premature shutoff. Replace with a complete spindle assembly (27).

3 - Record too thick:

The changer is designed to play standard records. If an old-style 1/8" thick record is used, the changer will shut off instead of dropping the record.

4 - Cut-off rod not being reset.

After the shut-off cycle, when the cut-off rod (67) has been turned to throw the switch to the "Off" position, the rod should be returned to its original position, the next time the machine cycles, by the bent-up end of the cut-off rod contacting the round stud on one leg of the control lever (67). The flat spring (98), acting against the cut-off rod, should throw the rod against its stop on the lift arm (96) and hold it there. If the cut-off rod is not fully turned, the bent-up end next to the spindle may stick up high enough to prematurely contact the shoulder on the pusher housing (33):

(a) Check the lever spring (98) for tension. Remove and bend slightly to increase tension, if necessary.

(b) Lubricate the cut-off rod bearings and around the lever spring with lubriplate or oil.

(c) Check the clearance between the end of the cut-off rod (97), which passes under the control lever (67), and the bottom of the round stud on the control lever. When the cut-off rod is in its normal operating position, it should not clear the bottom of the round stud by more than enough to completely turn the end of the cut-off rod from vertical position back to a horizontal position.

Turntable Continues To Rotate When Control Knob Is Turned To "Off" Position:

Switch defective.

Check switch for defects and replace if necessary.

PARTS LIST

WESTINGHOUSE V-6676

REF. NO.	PART NO.	DESCRIPTION
1	V-7854	Record Support Assembly - Metal
	V-7192	Record Support Assembly - Plastic
1A	V-7853	Knob, Record Support (Required Only With Metal Record Support)
2	V-7986	Pickup Arm Assembly - Includes:
		V-7985 Pickup Arm (2)
		V-7984 Cartridge (14)
		V-7987 Cartridge Screw (5)
		V-7988 Knob, Cartridge (15)
		V-7983 Strengthener And Pivot Assembly (6)
		V-7989 Chain And Spring Assembly (3 and 4)
		V-7982 Cable And Clip Assembly
		V-7990 Screw - Cartridge Knob (15A)
		V-7082 Screw - Strengthener (7)
		V-7979 Screw, Hinge Pivot
3 and 4	V-7989	Chain And Spring Assembly
5	V-7987	Cartridge Screw
6	V-7983	Strengthener And Pivot Assembly
7	V-7082	Screw - Strengthener
8	V-7991	Spacer
9	V-7992	Screw - Strengthener
10	V-7068	Adjusting Ring
11	V-7065	Spring - Adjusting Ring
12	V-7067	Screw - Adjusting
13	V-7067	Screw - Adjusting
14	V-7984	Cartridge
15	V-7988	Knob, Cartridge
15A	V-7990	Screw - Cartridge Knob
16	V-7980	Hinge Body
	V-7981	Hinge Body Assembly
		V-7074 Drive Pin
		V-7064 Spring, Cam
		V-7980 Hinge Body (16)
		V-7075 Catch (17)
		V-7076 Drive Pin
		V-7077 Hinge Cam
		V-7062 Trip Lever (19)
		V-7078 Spring, Catch (20)
		V-7079 Spring, Lever Return
		V-7063 Washer
17	V-7075	Catch
18	V-7077	Cam
19	V-7062	Trip Lever
20	V-7064	Spring
21	V-7071	Height Adjusting Screw
22	V-7178	Hinge Bearing
	V-7176	Hinge Bearing Assembly
		V-7178 Bearing Hinge
		V-7066 Set Screw
		V-7168 Bearing Cone
23	V-7066	Set Screw
24	V-7169	Ball Bearing
25	V-7168	Bearing Cone
26	V-7888	Turntable Assembly - (Including Turntable, Turntable Bushing, Turntable Hub, And Pinion Gear)
27	V-7889	Spindle Assembly
		V-8014 Spindle Shaft And Base Assembly
		V-8015 Roller Spring Housing And Pusher Shaft Assembly
		V-8016 Pusher Spring
		V-7148 Pin-Spindle Roller
		V-7164 Spindle Roller
		V-7149 Record Pusher

REF. NO.	PART NO.	DESCRIPTION
		V-7153 Pusher Pin
		V-7154 Pusher Shaft Spring
		V-7161 Roller Spring
		V-7162 Groove Spring
		V-7163 Roller Plunger
		V-8017 Spindle Guide
		V-8018 Guide Spring
28	V-8017	Spindle Guide
29	V-7149	Record Pusher
30		Wire Clip
31	V-7891	Turntable Washer
32	V-7890	Turntable Bearing
33	V-8015	Roller Spring Housing And Pusher Shaft Assembly
34	V-7164	Spindle Roller
35	V-8032	Motor Mounting - Pal Nut
36	V-8008	Motor Mounting Screw
37	V-8013	Base Plate Assembly
37A		Pickup Arm Rest
38	V-8027	Speed Control Knob
39		"C" Washer
40	V-8030	Speed Control Shaft Bearing
41	V-8028	Escutcheon, Slow-Standard
42	V-7084	Control Knob
42A	V-4979	Escutcheon, Off-On-Rej.
43	V-7083	"C" Washer
44	V-8031	Pal Nut Speed Control Bearing
45	V-7135	Mounting Spring - Base Plate
46	V-7141	"C" Washer
47	V-7060	Shipping Bolt
48	V-7122	Cam Locator
49	V-7074	Drive Pin
50	V-7123	Cam Locator Spring
51	V-8009	Motor Mounting Washer
52	V-8010	Motor Mounting Grommet
53	V-7096	Motor Mounting "C" Washer
54		"C" Washer (Part Of 59)
55		Fiber Washer (Part Of 59)
56	V-7977	Drive Wheel
57		Drive Wheel Tension Spring
58		Drive Wheel Shifting Cam
59	V-8011	Motor Assembly 110 V., 60 Cy. (Including Drive Wheel)
	V-8012	Motor Assembly 110 V., 50 Cy. (Including Drive Wheel)
60		Control Lever
61	V-7083	"C" Washer (Speed Control Shaft)
62		Rubber Grommet (Part Of 63)
63	V-8029	Shaft And Link Assembly, Speed (Includes Speed Control Shaft, Arm, Link, and Rubber Grommet)
64	V-7099	Switch Assembly
65	V-8000	Screw #6 x 1/4 Hex Head, Thread Cutting
66	V-7098	Reject Spring
67	V-8002	Control Lever
	V-8003	Control Lever Assembly
		V-7100 Control Link (Item 71)
		V-8002 Control Lever (Item (67)
		V-7106 Control Crank (Item 73)
68	V-7096	"C" Washer
69	V-7185	Set-Down Locator Spring
70	V-8001	Set-Down Locator
71	V-7100	Control Link
72	V-7993	Ratchet Arm
	V-7994	Ratchet Arm Assembly
		V-7074 Drive Pin
		V-7993 Ratchet Arm
		V-7995 Ratchet Pawl
		V-7996 Pawl Spring
73	V-7106	Control Crank
74	V-7181	Pickup Arm Locator Assembly
75	V-8033	Rubber Sleeve (Locator Bumper)
76	V-7171	"C" Washer
77	V-7172	Safety Spring
78	V-9993	Ratchet Arm
78 A	V-7995	Ratchet Pawl
	V-7994	Ratchet Arm Assembly
		V-7074 Drive Pin
		V-7993 Ratchet Arm (78)
		V-7995 Ratchet Pawl (78A)
		V-7996 Pawl Spring (79)
79	V-7996	Pawl Spring
80	V-7177	Lift Rod Spring
81	V-7173	Lift Rod
	V-8024	Ratchet, Locator, and Lift Rod Assembly
		V-7173 Lift Rod (81)
		V-7181 Locator Assembly (121)
		V-7994 Ratchet Arm Assembly (72)
		V-7177 Lift Spring (80)
		V-7172 Safety Spring (77)
		V-7141 "C" Washer
		V-7096 "C" Washer (82)
82	V-7096	"C" Washer
83	V-7116	Cam
	V-8005	Cam Assembly
		V-7074 Drive Pin (89)
		V-7116 Cam (83)
		V-8004 Pawl Spring (87)
		V-7118 Clutch Pawl (88)
		V-7119 Cam Stud Sleeve
		V-8006 Wire (85)
84	V-7120	"C" Washer - Cam
85	V-8006	Wire
86	V-7121	Fiber Washer
87	V-8004	Pawl Spring
88	V-7118	Clutch Pawl
89	V-7074	Drive Pin
90	V-7129	Trip Spring
91	V-8007	Trip Rod Bearing Plate (Large)
92	V-7999	Ratchet And Trip Rod Assembly
93		
94	V-797	Trip Rod Bearing Plate (Small)
95	V-8000	Trip Rod Bearing Plate Screw
96	V-7110	Lift Arm
	V-7111	Lift Arm Assembly
		V-7112 Roller Pin
		V-8000 Screw
		V-7110 Lift Arm (96)
		V-7102 Cut-Off Lever (97)
		V-7101 Pin
		V-7113 Roller (104)
		V-7108 Lever Spring (98)
97	V-7102	Cut-Off Lever
98	V-7108	Lever Spring
99	V-7126	Fiber Washer 1/64" Thick
100	V-7127	Fiber Washer 3/64" Thick
101	V-7125	Lock Washer
102	V-5050-82	Screw, No. 8-32 x 3/8"
103	V-8000	Trip Rod Bearing Plate
104	V-7113	Roller
105		Index Cam
106		Index Lever